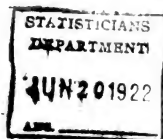


Report

Utah. Industrial Commission

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REPORT
of
THE INDUSTRIAL
COMMISSION
OF UTAH

Period
July 1, 1918, to June 30, 1920

INLAND PRINTING COMPANY
Kayville, Utah

STATE OF UTAH

REPORT

The Industrial Commission OF UTAH



MEMBERS OF COMMISSION

P. A. THATCHER, Chairman
WM. M. KNERR, Commissioner
W. P. MONSON, Commissioner

CAROLYN I. SMITH, Secretary

ADMINISTERING

Workmen's Compensation Act
Department of Immigration, Labor and Statistics
Metal Mine Inspection
Coal Mine Inspection
Boiler and Elevator Inspection
Labor Inspection
Factory Inspection
Firemen's Pension Law

**MEMBERS OF THE INDUSTRIAL COMMISSION
OF UTAH**

P. A. THATCHER, Chairman
WM. M. KNERR, Commissioner
W. P. MONSON, Commissioner

OFFICIAL STAFF

Carolyn I. Smith, Secretary
B. D. Nebeker, Referee
J. J. Peters, Reporter
Gladys Davis, Chief Stenographer
Mrs. L. King, Statistician
Edw. Jenkins, Assistant Statistician
Alvera Linden, Chief File Clerk
Viola Hall, Assistant File Clerk
Alda Silcox, Multigraph Operator

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C. A. Allen, Chief Mine Inspector
John Crawford, Coal Mine Inspector
Wm. E. Harrison, Metal Mine Inspector
Gerald R. Yearsley, Factory Inspector
Geo. B. Spahr, Boiler and Elevator Inspector
Zina H. Smoot, Labor Inspector
Viola DeHon, Stenographer

AGRICULTURAL DEPARTMENT

Miner M. Justin, Agricultural Statistician
Vera Rose, Stenographer

HD 53
U8
1918-1
(RECAP)

629665

December 15, 1920.

To His Excellency, Simon Bamberger,
Governor of Utah.

Sir: Pursuant to the requirements of the act of the legislature creating this department, we have the honor to submit herewith the Second Report of the Industrial Commission of Utah, for the period July 1, 1918, to June 30, 1920, same being the First Biennial Report of the Commission and the Fifth Report of the State Bureau of Immigration, Labor and Statistics, for the period 1918-20.

Respectfully submitted,

THE INDUSTRIAL COMMISSION OF UTAH.

P. A. Thatcher, Chairman.

Wm. M. Knerr, Commissioner.

W. P. Monson, Commissioner.

INTRODUCTION

The following pages contain the Second Report, which is the First Biennial Report of the Industrial Commission of Utah; also the Fifth Biennial Report of the Bureau of Immigration, Labor and Statistics, which bureau has been brought under the supervision of the Industrial Commission.

In addition to reports of heads of departments, there is contained herein much detailed information on payroll expenditures of industries which come under the Workmen's Compensation Act, and the relationship which such payroll expenditures bear to industrial insurance premium rates, amount of premium paid, analytical study of compensation and severity of industrial injuries, with compensation costs, including medical and surgical service.

A brief summary is given of the principal manufacturing industrial of the state, showing:

- (a) Number of establishments reporting,
- (b) Capital invested in industries,
- (c) Raw material used,
- (d) Value of finished product,
- (e) Total wages paid,
- (f) Number of employes, male,
- (g) Number of employes, female.

A distinctly new feature appears wherein the counties of the state are treated separately, showing the splendid development of the past and the enormous opportunities of the future in each. In a state so rich in historical data, in agricultural and mineral production, in scenic beauty, in future possibilities agriculturally, industrially and commercially, in climatic excellence, varying from the semi-tropical in the southern counties of the state to that which divides the year into four distinct seasons in the northern counties, such feature of this report cannot fail to arouse widespread interest.

Bulletin No. 1, containing decisions rendered in cases in dispute coming before the Industrial Commission, together with a brief summary of decisions in cases appealed to the Supreme Court, is published separately to avoid burdening this work with reports in which a minor fraction of the public only are interested. This supplementary portion of this report is available to those interested in this particular field of the Industrial Commission's activities. It contains also a concise report of

lump sum or commuted payments made under award of the Commission.

It appears hardly necessary to outline the functions and duties of the State Industrial Commission in this report. A careful review of the work herein outlined will disclose the nature of the work imposed upon this body more effectively than to read a brief resume of the law creating and defining the duties of the Industrial Commission of Utah. Such review, consistently made, will acquaint the individual with his rights under the Workmen's Compensation Law, as well as his rights under the other laws administered by the Commission. The relationship between the public and the public servants who are appointed to hold office upon the Industrial Commission will, it is hoped, be better understood and result in benefits desired by all.

REPORT OF REFEREE**For Biennium Beginning July 1, 1918, and Ending****June 30, 1920**

In compliance with your request, I respectfully report that in addition to the regular duties connected with the hearings held in relation to Workmen's Compensation cases, the referee has heard, considered and action taken toward the adjudication of minor complaints received from various parts of the state, numbering 436, including the collections of wages for labor performed, male, 240, female, 58; controversies involving agreements and wages earned, 102; differences arising between prospective employes and employment agencies, 28; assistance extended wherein bad checks were issued in payment for labor, 9; together with many complaints outside the jurisdiction of the Commission, in which the referee could only advise and offer suggestions for settlement.

Assistance has been extended and actual collection made in small amounts to that of substantial sums, without cost to the parties concerned, and in which justice has been secured without recourse to the common remedy and expense of court litigation.

We have not always met with success, however, the results have been well worth the effort.

Respectfully submitted,

B. D. NEBEKER,

Referee.

The Following Orders

Adopted By

The Commission

Pertaining To

The Conduct and Supervision

of

Employment Agencies

RESOLUTION NO. 56

Be It Resolved That, by virtue of Sub-section 6, Section 3076, Compiled Laws of Utah, 1917, as amended by the Laws of Utah, 1919, the following order be and the same is hereby promulgated by the Industrial Commission of Utah:

That all private employment agencies now existing within the State of Utah and any person who shall begin the operation of a private employment agency, shall file with the Industrial Commission of Utah a statement, under oath, setting forth the name under which such employment agency is or is to be operated, the location thereof, the name of the person owning same, the officers and directors, if it be a corporation, and the name of the person constituted as agent of such person or corporation, the names and addresses of the sureties providing the indemnity as required by Section 2443 of the Compiled Laws of Utah, 1917, the prices to be charged for the service and generally and particularly a statement of terms and conditions under which said employment agency is or is to be operated.

It is hereby ordered that the Secretary of the Industrial Commission of Utah mail to each private employment agency doing business within the State of Utah, and to the official collecting the licenses in the cities of the state, a certified copy of the foregoing order and that the action of the Industrial Commission in promulgating such order be given to the press, in order that the same may be disseminated as quickly as possible.

Approved by the Industrial Commission of Utah August 9, 1919.

RESOLUTION NO. 59

Pursuant to a public hearing held August 25, 1919, under Resolution No. 57, and discussion then had, from which it appeared that Resolution No. 57 should not be made a permanent order of the Commission, but that the terms thereof should be modified, Be It Resolved, that said Resolution No. 57 be, and the same is hereby rescinded; and be it further

Resolved, that by virtue of Section 3076, Compiled Laws of Utah, 1917, as amended by the Laws of Utah, 1919, the following order be and the same is hereby pro-

mulgated by the Industrial Commission of the State of Utah:

On and after October 1, 1919, no private employment agency within the State of Utah shall furnish any workmen to any employer of labor of any kind or description, without having a bona fide order for the same from said employer and without having secured from said employer the following information, which shall be set out in detail in tickets given by the employment agent to workman or employe, to-wit:

The name of the prospective employer;

The place of such employment;

The kind of labor to be performed;

The wages to be paid;

The date of pay days, whether weekly, semi-monthly or monthly;

The eating and sleeping accommodations and cost thereof, whether such accommodations are conducted by the employer or by others under contract or other arrangements;

The cost of transportation to the place of employment and whether or not the same is advanced by the employer, definitely stating further the terms and conditions under which the same are to be repaid.

Where and to whom the employe is to report;

Generally and particularly any information which will give the employe a full and comprehensive knowledge of the conditions under which he will be expected to work;

Whether or not a strike or lockout is in progress among the employes of said employer.

Said information shall be set out in detail on a ticket, the form of which will be prescribed by the Industrial Commission and which ticket, when issued to workmen or employes, shall be signed by the employment agent issuing the same and by the employe or employes receiving the same.

One copy of said ticket shall be retained by the employe and one delivered by him to the employer, and a full copy of the same shall be retained by the employment agent.

Passed by the Industrial Commission of Utah, August 28, 1919.

RESOLUTION NO. 64

Pursuant to the provisions of law and of Resolution No. 61 adopted by the Industrial Commission of Utah on September 4, 1919, the following are now adopted by the Industrial Commission of Utah as the Rules and Regulations to be observed by employment agencies:

1. It shall be unlawful for any person to open, establish or operate within the State of Utah any employment office for the purpose of procuring or obtaining for money or other valuable consideration, either directly or indirectly, any work, employment or occupation for persons seeking same or to otherwise engage in the business or in any way to act as a broker or go-between between employers and persons seeking work, without first having obtained from the Industrial Commission of Utah a license so to do.

Any person performing any of the foregoing enumerated services as aforesaid shall be deemed to be an employment agent within the meaning of this resolution.

2. All persons required to pay licenses as provided in this resolution shall pay to the Industrial Commission of Utah the sum of five dollars (\$5.00) per annum for such license.

3. The license issued by the Industrial Commission of Utah shall be posted in a conspicuous place in the agency conducted by the person obtaining such license.

4. Application for license shall be made in writing and on a form prescribed by the Commission, to the Industrial Commission of Utah. Such application shall state the name and address of the applicant, the street and number of the building or place where the business is to be carried on, the business or occupation engaged in by the applicant for at least two years immediately preceding the date of application.

The application must be accompanied by affidavits of at least two reputable residents of the city where the business is to be carried on (preferably business men) to the effect that the applicant is a person of good moral character.

5. Upon receipt of such application for license, the Commission may cause investigation to be made as to the character and responsibility of the applicant and of the premises designated in such application as the place where it is proposed to conduct such agency.

The Commission may administer oaths, subpoena witnesses and take testimony in respect to matters contained

in such application, and in complaints of any character against the applicants for such license, and upon proper hearing may refuse to grant a license or may revoke one outstanding.

Each application shall be granted or refused within thirty days of filing.

Whenever it shall be shown, after hearing upon notice, that any licensee, or his agent, has violated or failed to comply with any of the orders, rules or regulations of the Industrial Commission, or any state law or city ordinance, or when such licensee has ceased to be of good moral character or when the conditions under which the license was issued have changed or no longer exist, the Industrial Commission will revoke any outstanding license. At the hearing conducted by the Industrial Commission, it will not be bound by the technical rules of evidence.

6. Every license shall contain the name of the person licensed, the name of the city, and shall designate the street and number of the house or premises in which the person licensed is authorized to carry on such employment agency, and the number and date of such license. Such license shall not be transferable or assigned without the written consent of the Commission and such license will not protect any person other than the one designated in the license.

No municipality in the state shall issue license to any person to carry on the employment agency business unless or until he shall have first obtained from the Industrial Commission a license to carry on such business, and the municipality shall revoke the license of any employment agent issued by it to such licensee, upon the filing with the proper officer of such municipality of a proper notice from the Industrial Commission to the effect that said Commission has revoked such license after a hearing.

This resolution of the foregoing rules and regulations shall be in effect on and after January 1, 1920.

WM. M. KNERR.

WM. P. MONSON.

P. A. THATCHER.

RESOLUTION NO. 58

Be It Resolved, that it is the sense of the Industrial Commission of the State of Utah that hereafter an employer of labor who places with any employment agent an order for more employes than he actually desires, or who places duplicate orders for employes with employment agents, shall be liable to the employes who are in good faith furnished by said employment agent or agents in excess of the number actually desired by said employer, for costs of transportation both ways incurred by such employe or employes, and for reasonable expense incurred by such employe or employes by reason of the trip to the place of employment and for the time actually lost by said employe or employes in answering such excess or duplicate order.

Passed by the Industrial Commission of Utah, Salt Lake City, August 28, 1919.

EMPLOYMENT AGENCIES LICENSED BY THE INDUSTRIAL COMMISSION OF UTAH

Salt Lake City, Utah

Salt Lake Employment Agency (two licenses)
Western Employment Agency.
Herman Kuhn Employment Agency.
Strock's Employment Agency.
Utah Employment Agency.
Intermountain Employment Agency.
Jeff Pino Labor Agency.
R. H. Canham Employment Agency.
J. E. Dillon Employment Agency.
Salt Lake Guarantee Employment Agency.
M. J. Dixon Employment Agency.
National Employment Agency.
State Employment Agency.

Ogden, Utah:

Jones Employment Agency.
Ogden Employment Agency.
Interstate Employment Agency.
Mutual Employment Agency.
Major Employment Agency.
Davis Employment Agency.

The Following Report

RELATES TO

The Board Labor

Conciliation and Arbitration

AS PROVIDED IN

Title 58

Compiled Laws of Utah

1917

Salt Lake City, Utah,
August 29, 1919.

The Industrial Commission of Utah,
State Capitol.

To Whom It May Concern:

The following statement, issued by the Industrial Commission of Utah, is made with a view to giving employers and employes the necessary information which we believe they are entitled to, in case of controversies existing between employer and employee.

Chapter 100, Session Laws of Utah, 1917, as amended by the legislature of 1919, designated as Title 49, Compiled Laws of Utah, 1917, created the Industrial Commission of Utah.

Under Section 3076, Sub-division 9, the law provides:

"All duties, liabilities, authority, powers and privileges conferred and imposed by the law upon the commissioner of immigration, labor and statistics, state mine inspector of coal and hydro-carbon mines, and board of conciliation and arbitration are hereby imposed upon the commission. All laws relating to the commissioner of immigration, labor and statistics, state mine inspector of coal and hydro-carbon mines, and board of conciliation and arbitration shall apply to, relate and refer to the Industrial Commission of Utah. The Industrial Commission of Utah shall be deemed the commissioner of immigration, labor and statistics, state mine inspector of coal and hydro-carbon mines, and board of labor, conciliation and arbitration with in the meaning of existing laws."

Title No. 58, Compiled Laws of Utah, 1917, relating to the Board of Labor, Conciliation and Arbitration, under Section 3636, provides that whenever it shall come to the knowledge of the said board that a strike, or lockout, is seriously threatened in the state, involving any employer and his employes, if he is employing not less than ten persons, it shall be the duty of said board to put itself into communication as soon as may be with such employer and employes, and endeavor by mediation to effect an amicable settlement. Said board shall also request each of the parties to forward to its secretary an application for arbitration.

Section 3637 provides that as soon as practicable after receiving such applications, the board shall request each

of the parties to the dispute to agree upon a written statement of facts relating to the controversy, and to submit the same to the board; provided that, when such agreement and statement cannot be reached, each of said parties may separately submit to the board a written statement of grievances. Applications to the said board for arbitration on the part of the employers must precede any lockout, and, on the part of the employees, any strike; provided that, in case lockout or strike already exists, the board shall accord arbitration if the parties shall resume their relations with each other, as employer and employees. Said applications shall include a promise to abide by the decision of the board and shall be signed by the employer or employers, or his or their authorized agent, on the one side, and by a majority of his or their employees on the other.

You will notice that this section makes it mandatory on the part of the board, in case a lockout or strike already exists, to accord arbitration if the parties shall resume their relations with each other as employer and employee and the application for arbitration shall include a promise to abide by the decision of the board and shall be signed by the employer or employers or his or their authorized agents on the one side and by a majority of his or their employees on the other.

Under Section 3639, the board shall have power to summon as witnesses by subpoena any operative or expert in departments or business affected, and any person who keeps the record of wages earned in those departments, or any other person, and to administer oaths, and to examine said witnesses, and to require the production of books, papers and records. In case of disobedience to a subpoena the board may invoke the aid of any court in the state in requiring the attendance and testimony of witnesses, and the production of books, papers and documents under the provisions of this section.

Section 3640 provides that it shall be the duty of mayors of cities and sheriffs of counties, when any condition likely to lead to a strike or lockout exists in the cities or districts where they have jurisdiction, to immediately forward information of the same to the secretary of the State Board of Conciliation and Arbitration (the Industrial Commission of Utah). Such information shall include the names and addresses of persons who should be communicated with by the board.

Section 3642 provides that as soon as practicable after the board has investigated the differences existing between the employer and employees, it shall make an equitable de-

cision, which shall state what, if anything, should be done by either or both parties to the dispute, in order to amicably settle and adjust the differences existing between them. The findings of a majority of the board shall constitute its decision.

Section 3643 provides that this decision shall at once be made public, shall be recorded upon the proper book of record to be kept by the secretary of said board, and a short statement thereof published in an annual report to be made to the governor.

During the period of the war, the Industrial Commission of Utah endeavored to do everything possible to maintain harmonious relations between employers and employes, to the end that the output of our industrial institutions should be maintained at the highest possible point of production. In doing so we frequently exerted out influence to conciliate differences, whether real or imaginary, even though in some cases it required the intervention of the Commission where strikes had actually been declared. Since the war is happily ended, the necessity for such intervention does not appear to be longer justified.

In its work as a Board of Conciliation and Arbitration the Commission will hereafter be guided strictly by the spirit and letter of the law which created the board. We invite all parties to any controversies involving questions of working conditions, wages, or of whatsoever other cause which may seriously threaten a strike or lockout, to submit their cases to this Commission in the manner provided for by the sections above enumerated. In all such cases we will make such investigations as may seem proper and arrive at decisions as speedily as possible. We are convinced, however, that to invoke a strike at this time, in order to increase wages, merely aggravates the situation and acts as a positive hindrance to the proper adjudication of differences that may exist. May we respectfully suggest at this time that parties to all controversies of this character refrain from taking any action that will have a tendency to cause dissatisfaction and misunderstanding, or in any way aggravate the situation or hasten ill-advised action. It is understood, of course, that the law is not compulsory and that it rests with those for whom it was enacted whether they will avail themselves of its provisions.

The following is a brief synopsis of the different disputes coming before the Commission, together with the awards rendered by the Commission sitting as a Board of Labor Conciliation and Mediation.

December 18, 1918, the telephone operators of Salt Lake City of the Mountain States Telephone company claimed that they were being discriminated against on account of their affiliation with the operators local union, the matter was referred to the United States Department of Labor with the request that they assist in the adjudication of the controversy, the United States Department of Labor sent Mr. Rodiër to assist the Commission and on December 17, 1918, the Commission held a hearing and secured statements from a number of telephone operators, same was forwarded to the United States Department of Labor, the matter was finally settled without a strike.

On August 8, 1918, Mr. Lee, representing the metal trades, telephoned the Commission relating that the men employed by the Bingham & Garfield Railway had asked for an increase in pay and he related that the company did not seem disposed to grant the increase. The Commission advised Mr. Lee that the difference existing between the officers and employes of the miners and smelters in that district had been referred to the War Labor Board and advised that they do the same, which was agreed to. No strike.

On September 4, 1918, Salt Lake Printing Pressmen's Union No. 148, of Salt Lake City, were unable to agree as to the question of wages to be paid, the Commission at that time requested all members of the union to submit the question to arbitration. The members of the Printing Pressmen's Union rejected the offer of arbitration and called a strike to take effect September 5 on all shops that refused to pay the scale of wages as proposed by the committee. On September 6 the Printing Pressmen's Union decided to submit the question to arbitration, provided Commissioner Knerr would be a member of the arbitration board, and the other two members to be secured as follows: One member by the employers and one members by the employes, this was agreed to and the employes returned to work after being off for a period of six days. The award was rendered by the board and accepted by both parties.

On September 27, 1918, the proprietors of the barber shops of Salt Lake City advised the Commission that the journeymen barbers threatened to strike and requested the Commission to use their best efforts to prevent the strike. The Commission succeeded in having the journey-

men barbers enter into negotiations with the master barbers with one member of the Commission present, and the barbers finally agreed to satisfactory settlement and agreement. No strike.

On July 5, 1918, certain employes of the Ogden Packing & Provision Company claimed that they were discharged on account of their affiliation with the local union, affiliated with the American Association of Labor, the Commission referred the matter to the War Labor Board, the War Labor Board selected the Hon. Verner C. Reed and D. P. Marsh, who made investigation, the matter was finally settled peacefully.

On July 12, the Gas Workers' Local Union agreed to submit to arbitration the controversy between them and the Utah Gas & Coke Company. The arbitration board consisted of one member selected by the employers and one member by the employees and the two members thus selected appointed Mr. F. C. Richard, president of the Salt Lake Commercial Club, to act as a third member. The Utah Gas & Coke Company requested the Commission to use their good offices in requesting the employes to comply with their agreement to arbitrate. After conferring with the employes they finally agreed to submit to arbitration and the matter was settled peacefully.

On July 13, 1918, the employes of the Utah Light & Traction Company in the mechanical department were dissatisfied as a result of Mr. Scobee having been discharged, the men asking that Mr. Scobee be retained as the head of the various departments involved. It was finally agreed by the Utah Light & Traction Company and a committee representing their employes, that a member of the Industrial Commission of Utah arrange to take a canvass of the employes employed at the shops for the purpose of ascertaining their attitude in relation to this matter. The majority of the employes voted that the matter be dropped with the understanding that if it later developed that Mr. Scobee became obnoxious, the employes should have the right to take the matter up with the company in the regular way as stated in the agreement between the traction company and its employes; settled peacefully without a strike.

On October 9, 1918, the Painters' Local Union No. 77 requested the Commission to induce the contracting painters to submit the question of dispute of wage to arbitration, they charged that the contracting painters locked them out on September 23, 1918, and the Commission submitted a communication to the Contracting Painters' Association

on October 11, 1918; they refused to submit the question to arbitration, related that the master painters had broken no agreement or contract and the men could come back to work at \$6.00 per day. Finally a number of contracting painters agreed to submit the question to arbitration, and the arbitration board was selected on the following basis: contractors selecting one member, employes selecting one member and the two thus selected to appoint a third member. They appointed Commissioner Knerr to act with them on October 15, 1918. The arbitration board rendered their award increasing the wages from \$6.00 to \$6.60 per day; however, where they employed men on contract prior to September 23, 1918, in that case the scale to be paid should be \$6.00 per day, overtime should be paid at the rate of double time. This was satisfactory and accepted by all parties concerned.

On November 22, 1918, the Electrical Workers' Local Union No. 354 claimed that they had no jurisdiction to do the inside electrical work on the Deseret National Bank building. It appears that the telephone company was installing cable from the street to the Deseret National Bank building and had an agreement with the Electrical Workers' Union No. 57, to do any na dall electrical work required to be done by the telephone company; members of the Local Union No. 354 and the building trades crafts threatened to strike unless this matter was settled satisfactorily. The international officers of the Electrical Workers' Union finally instructed the members of Local Union No. 354 to return to work pending the arrival of one of their international officers, this was agreed to and all returned to work.

During the month of January, 1919, the employes of the Utah Copper Company and the Garfield Smelting Company were somewhat agitated over the prospect of receiving an increase and a possible decrease in wages. At the request of the United States Department of Labor at Washington, D. C., a member of the Industrial Commission, together with a member representing the different crafts, were invited to come to Washington for the purpose of discussing the situation of the copper producing mines. After the conference at Washington, presided over by the Hon. William B. Wilson, secretary of the United States Department of Labor, it was agreed to be practically impossible to grant an increase of wages at this time on account of the copper market. The committee returned and at a meeting of the employes on February 14 and 15, the employes of the Garfield Smelting Company voted to strike. The United States Department of Labor, together with

the Industrial Commission of Utah, made an effort to stop the strike, and after considerable negotiation the men agreed to go back to work with the understanding that the Garfield Smelting Company arrange to have employees' committees elected for the purpose of taking up any disputed matters that may arise in the future.

On February 17, 1919, street railway employees of the Utah Light & Traction Company requested the Commission to refer possible controversy over wages to the War Labor Board, finally agreed between both parties to submit the matter to the arbitration board, consisting of one member selected by the employees and one member selected by the employees, the two members thus selected to appoint the third member. Award rendered by the arbitration board accepted by both parties. No strike.

On May 1, 1919, the members of the Culinary Alliance Union No. 815, Cooks and Waiters, walked out on account of a misunderstanding as to wages. On May 5 the Commission succeeded in having the members of the Culinary Alliance and members of the Restaurant Men's Association agree to submit to arbitration three questions: First, hours; second, wages and overtime; third, the arbitration board was to consist of one member selected by the Salt Lake City Hotel and Restaurant Men's Association, one member to be selected by the union, and the two members thus selected to select the third member. It was agreed that the Salt Lake City Hotel and Restaurant Men's Association agree to re-employ the men who joined in the general walkout. After the arbitration board was organized the employees indicated that when they agreed to arbitrate with the employers it meant an agreement on the part of the employers to recognize the union agreement or closed shop. The employers resisted and would not agree on this point, offering the counter proposition as follows: "First, that the members of the Restaurant Men's Association will not discriminate against the union members, and that where conditions are equal they will give them preference in employment; second, that the Restaurant Men's Association recognize the right of every man or woman to join any organization or union not repugnant to law, and feel like encouraging the same, but in doing so they do not deem it advisable to enter into an agreement for an absolute closed shop." The employees rejected this proposition on May 13, 1919, and voted to strike and did strike. The matter has to this date not been settled, the majority of the restaurants operating under open shop.

On May 5, 1919, the Master Bakers' Association of Utah addressed a communication to the Industrial Commission asking that they endeavor to have the journey-men bakers agree to arbitrate the question of wage. The Commission endeavored to induce the employees to accept arbitration; instead of accepting the question of arbitration they requested the Commission, if possible to arrange a conference between them and the employers. Under date of May 6 the employees requested the Commission to submit a proposition to the master bakers for arbitration with the understanding that the employers agree to employ only members of the local union in case they agree to arbitrate. This the master bakers refused to do and the Commission informed both parties they were unable to adjudicate the difference. The matter was finally settled without aid of the Commission.

On May 6, 1919, the Industrial Workers of the World in Park City succeeded in having the men join them in a general walkout. They demanded the six-hour day at \$1.00 per hour. On May 7 the Commission proceeded to Park City for the purpose of offering our services to the men on strike and on that day the men held a meeting and permitted Commissioner Knerr to address them. The meeting was in absolute control of the Industrial Workers of the World and our negotiations in this case failed. We requested the assistance of the United States Department of Labor and after prolonged negotiations the matter remained unsettled. The facts are that the Industrial Workers of the World took the men by storm and off guard. It later developed that the majority of the miners in Park City regretted the step they had taken in joining the strike and the mines remained closed up to and including June 18, 1919. It appears to the Commission that this strike was lost and detrimental to the general welfare of the community and to the employees of Park City.

On May 24, 1919, employees of the Cudahy Packing Company of Salt Lake City threatened to strike. They requested the Commission to aid them in securing wages in accordance with the Judge Alschuler award, made in Chicago; the Commission got in communication with the general manager of the Cudahy Packing Company, Chicago, the matter settled satisfactorily to both parties. No strike.

On June 23, 1919, the Commission received a request from the Brick and Clay Workers' Union No. 318, to act as mediator between the members of the union and the Utah Fire Clay Company, a strike being in progress since

June 21, 1919; the Commission got into communication with the Utah Fire Clay Company; the employers refused to make any concession to the men. On June 26 the Commission made an effort to induce the employer to submit the matter to arbitration and on the same day the employer definitely refused to arbitrate, giving as a reason that there was nothing to arbitrate, that "the chances of having to stay shut down were better than the possibility of being compelled to operate at a higher cost of production." In this case the Commission failed. The men finally went back to work.

On July 5, 1919, the members of the Glaziers' Local Union No. 911 voted to strike unless the employers granted their demand for an increase in wage, the employers declined, the men did strike on July 5, 1919. The employees and employers involved agreed to submit the controversy to the Industrial Commission of Utah, both sides agreed to abide by the decision of the board and the majority of the members of the board on October 23, 1919, rendered an award denying their request for an increase in wages. The following is a copy of the award rendered by the Commission. Employees returned to work August 16, 1919.

In the Matter of the Controversy between Glaziers' Local Union No. 911 and Employers, wherein the question has arisen as to wages and hours, and in which the Industrial Commission of Utah was requested by both parties interested, under date of September 23, as to the Glaziers' Local Union and September 26 as to Employers, to sit as a Board of Arbitration to determine the question.

DECISION

Said Commission, having heard the evidence submitted by both sides and having made considerable inquiry to familiarize itself with existing conditions in competitive fields, and also as to the conditions locally governing this class of work as compared with employment in general, it is concluded by the Industrial Commission, acting as a Board of Arbitration in this case, that there is no legitimate cause for complaint on the part of the employes in this case. The board finds that the conditions under which these men work are, comparatively speaking, satisfactory. We further find that the wages paid for this class of work as compared with other wages in this locality, and also in competitive fields, are in keeping with the nature of the work performed.

It is therefore the decision of this board that the existing conditions maintain until such time as there should arise a sufficient change in conditions generally to justify a modification of this decision.

BOARD OF LABOR, ARBITRATION, AND CONCILIATION.

W. P. MONSON.

P. A. THATCHER.

DISSENTING OPINION

I feel obliged to submit a dissenting opinion in this case. We may well ask: "Does arbitration mean that the workmen will be compelled to submit to conditions that do not conform to the present well established standard?" as a peaceful means of settling labor disputes.

While the war was raging, the workers were promised that they would be given a larger voice in the affairs of industry, that labor would be given a larger share of the profits, that conditions of labor would be better, that hours would be shortened, that wages would be larger, and the lot of the workingman would be good. Labor accepted all these promises at their face value and worked and fought with redoubled vigor to win what was to be secured for themselves and the generations to come after them—all the good things promised to labor—and this was done with implicit faith that these promises would be fulfilled to the letter after the war had been won by the allies. Now that the war is over, labor is naturally looking to those in power to fulfill their promises. Shall this Commission say to the Glaziers' Local: "We refuse to concede to you the justice of your contentions for the forty-four hour week," when as a matter of fact, over 95 per cent of the building trades crafts of which the glaziers' are a part have established a forty-four hour week as the established standard? Investigation of one hundred twenty-five of the principal cities of the United States indicates that one hundred three out of the one hundred twenty-five cities enjoy an eight-hour day and forty-four hour week. I feel that the granting of the forty-four hour week to the workmen at this time is even more important than an increase in the wage. Taking into consideration the fact heretofore mentioned that practically all the building trades workmen in Salt Lake City today have for a number of years past enjoyed a forty-four hour week, it seems to me that it should be recognized in the building trades as an established standard. Generally, the reasons advanced for the reduction of hours and more often emphasized is the health danger. It seems to me that the lack of leisure time for family life, for recreation, for all the requirements of citizenship, is no less an evil. Surely, we all agree that without specific leisure the process of forming character can only be begun. It can never advance nor be completed. People would be mere machines of labor, nothing more, unless we recognize that the workers are entitled to a certain amount of time

which they may invest in educating themselves and securing and enjoying the necessary recreation.

It is argued that if the Saturday half-holiday is granted that the output will decline proportionately. This might be true if human beings were mere machines and not living creatures who grow tired, but as a matter of fact, the lack of diminishing returns operates no more strikingly in shorter hours of labor. Statistics of output before and after the shortening of hours of labor show that when the human element enters into production, hour reduction by no means implies a decrease in output. No one can or will deny that where you have a dissatisfied group of workmen, you will find production at its lowest ebb. Naturally, the glaziers of this city are dissatisfied to work forty-eight hours per week for the reason that they know their fellow craftsmen work only forty-four hours per week. It seems to me that the greatest stimulant to efficiency and production can be obtained by establishing certain fundamental and satisfactory standards for the workmen. A refusal at this time of the forty-four hour week means that the worker has very little time for the finer things of life. He is a machine, working merely to keep himself alive, to go on working, and sooner or later the consciousness of this ebbs into his soul and he becomes discontented, careless and, too often, a material to be molded into the hands of the radicals and extremists.

In my opinion, higher wages and shorter hours must obtain in order to enable the worker to keep himself and his family decently, and by thus removing the main cause of industrial unrest, you offer a substantial incentive and give the worker more encouragement to put his full energy into his work. Shorter hours and higher wages are necessary not only because the workers of this country demand them, but because it is only by reducing hours and granting high wages that the output can be increased. The three things, short hours, increased production and high wages, are inseparable. They act and interact on each other.

For the reasons above mentioned, I cannot agree in the decision rendered by the majority of the Commission.

WM. M. KNERR,

Commissioner.

On August 20, 1919, the employees employed in the Contract Machine Shops in Salt Lake City voted to strike. The question in controversy was one regarding wages and the open and closed shop. The Commission in this case offered its services, advising both the employer and the employees that the Commission would be very glad to act as mediator and conciliator with the understanding that both parties agree, in case our effort to conciliate failed, to submit the question to arbitration. The parties in interest did not seem to be willing to accept the services of the Commission. On June 30, 1920, the matter remained unsettled, the employees claim that the men are still out on strike and declare the various contracting shops unfair to organized labor; whereas the employers claim that they have replaced all men who went out on strike; so far as they are concerned, the matter is settled. They declare the strike lost.

On August 30, 1919, the Commission addressed a communication to the management of the Ogden Gas Plant and employes, offering to assist in the adjudication of the labor dispute over wages. The matter was settled without a strike and without the aid of the Commission.

On September 2, 1919, the Printing Pressmen's Union No. 148 went on strike for increased pay; they remained on strike for a period of seven days; the Commission offered to assist in adjudicating the dispute; however, before the parties in interest had time to reply an international officer of the Pressmen's Union arrived and ordered the men to go back to work pending negotiations with the employers.

On September 4, 1919, the Commission addressed a communication to the Globe Grain & Milling Company of Ogden, Utah, offering our services in the adjudication of a dispute, the men being on strike. The Commission failed to receive a reply from either party concerned. The matter was settled without the aid of the Commission.

On November 11, 1919, the Union Mine Workers of America addressed a communication relating that certain members of their local organization employed by the United States Fuel Company and the Standard Fuel Company in Carbon county, Utah, were discharged for the reason that they were members of the Union Mine Workers. This matter was referred to the United States Department of Labor, who made a complete investigation of the matter and it was settled peacefully.

On October 17, 1919, the employees of the Utah Light & Traction Company addressed a communication to the

Commission asking that we arrange a joint meeting to be held under our direction between the representatives of the Utah Light & Traction Company, the Public Utilities Commission, the City Commission of Salt Lake City, the Commercial and Rotary Clubs, representatives of the American Federation of Labor and the employees of the Utah Light & Traction Company for the purpose of discussing the question of an increase in wage. It appears that the employees had an agreement with the Utah Light & Traction Company running up to the 1st day of May, 1920. The employees represented to the Commission that they had no desire to violate their agreement, they felt that the cost of living was so high that if a conference could be arranged as above outlined with the parties mentioned that the company might voluntarily grant them an increase. The Commission addressed a communication to the parties involved at the conference and after considerable correspondence it was decided inadvisable to hold said conference and the employees dropped the matter.

On December 20, 1919, the employees of the Ogden Portland Cement Company went out on strike. On December 22, 1919, the Commission addressed a communication to the Ogden Portland Cement Company and the employees on strike, offering to assist them in adjudicating the differences provided the men would be returned to work in their former positions without discriminations. On December 26 the employees advised the Commission that they would comply with the request of the Commission. On December 31, the Ogden Portland Cement Company, through its representative, Mr. Day, also agreed to comply, the men returned to work were out on strike for a period of six days. The matter was finally submitted to the Industrial Commission as a Board of Arbitration. The following is the award rendered by the board on November 25, 1920. On July 2, 1920, the employees of the Ogden Portland Cement Company asked the Commission to determine the question as to whether or not the employees at this time would be entitled to an increase in wages and on July 31, after having held a hearing granting the employees an opportunity to show cause why the former award of the Commission should be modified and the wages increased. On July 31, the Commission advised the employees that the request for wage increase was not justified and therefore denied.

In The Matter of the Controversy Between the Employes and the Ogden Portland Cement Com- pany.	} Award of Arbitration By the Industrial Commission of Utah.
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On December 23, 1919, a committee representing the employes of the Ogden Portland Cement Company called on the Industrial Commission and informed the Commission that such employes were then conducting a strike for higher wages and shorter hours of labor, and several other minor differences. It appears that the employes had then been out about six days. This committee appealed to the Commission for aid in adjusting their differences. The men were advised that as a condition precedent, all employes must return to work in accordance with the law, and that they then negotiate with the company for an adjustment of their differences and that if it were desirable the Commission would be glad to tender its services after an agreement had been reached upon as many points as possible and any difficulty could not be so resolved, in an endeavor to bring about an amicable adjustment. The men, following the advice of the Commission, agreed to return to work and the Commission accordingly approached the employer and the employer agreed to take back all striking employes without discrimination and to follow the course suggested by the Commission.

In accordance with the suggestions made by the Commission, negotiations between the employes and employer resulted in an adjustment of several of the difficulties and there was finally referred to the Commission for investigation, arbitration and award the following question: The amount of wages per hour, with time and one-half for over-time, using as a basis an eight hour day.

The Commission appreciated very much the spirit shown by the employes and employer in submitting this case without reserve to the Commission as a Board of Arbitration, both parties agreeing to abide by the decision of the Commission with the understanding that the award of the Commission should remain in full force and effect for one year, dating from January 15, 1920, to January 14, 1921. The Commission feels, however, that it may be necessary to reopen the questions at hand at the end of six months from the date of the award on account of the existence or development of unforeseen or peculiar circumstances, and it is therefore understood that owing to such circumstances the questions herein adjudicated may

be reopened and re-examined at the end of six months.

The Commission, in making its investigations preliminary to the award, found that they had thirty classifications of employes and some inequalities. In determining the matters involved, the Commission made a visit to the plant and made a study of the working conditions, and as a result of its investigations, has reduced the classifications of employes to seven classes, which the Commission feels is more nearly just to the employer and employe and reduces to a minimum the inequalities found in the old classification.

Upon the issue submitted to the Commission, the Commission finds and decides as follows:

CLASS "A"	{	Blacksmiths
75c per hour		Machinists
		Electricians
CLASS "B"	{	Carpenter
65c per hour		Repairman
		Coal Miller
		Burners
		Engineer
		Excavator operator
CLASS "C"	{	Wet end miller
60c per hour		Finish miller
		Stock house foreman
		Repairman helper
		Carpenter helper
CLASS "D"	{	Coal miller helper
55c per hour		Electrician helper
		Burner helper
		Excavator operator helper

CLASS "E"	{	Laborers (including all not otherwise scheduled)
50c per hour		Wet end miller helper
		Finished miller helper
		Gypsum man
CLASS "F"	{	
\$7.50 per day		Teamsters

All of the foregoing wages are based on an eight-hour day, with time and one-half for overtime.

SPECIAL	{	Storekeeper	\$127.00 per month
		Night watchman	\$140.00 per month

Contracts to stand as they are without change.

The master mechanic was not included in the list of employees interested in this matter, but the Commission suggests that he receive a proportional increase with the increases herein awarded.

WM. M. KNERR,
W. P. MONSON,
P. A. THATCHER,

Commissioners.

On May 3, 1920, controversy arose between the Utah Association of General Contractors and Building Trades Council; the building operations in Salt Lake City were technically at a standstill. On June 24, the Commission addressed a communication to the parties concerned, offering our services. The Utah Associated General Contractors, under date of June 28, 1920, replied to the Commission that in their judgment building in the city was pursued without dispute as to wages and working conditions and that they were unable to see why this condition between the contractors and craftsmen would be a matter susceptible to arbitration. The craftsmen replied to the Commission that they felt that nothing would be gained in entering into negotiations at this time, the main question involved in this dispute was the question known as the open and closed shop. On June 30, 1920, the matter, according to the representative of the Building Trades Council, was unsettled.

Twelve of the foregoing disputes resulted in a strike, two of which were settled by arbitration. Four disputes were referred to the United States Department of Labor, assisted by the Commission. Three were referred to the War Labor Board, two were settled by arbitration without a strike.

It is charged in three disputes that the employers practiced discrimination. Four disputes were caused by controversies over wages. The Commission failed to settle five disputes. Three disputes involved the question of open and closed shop; two were settled by the Commission sitting as a Board of Labor Conciliation and Arbitration, and three were settled without the aid of this Commission.

The foregoing merely represents disputes of which the Commission had official notice.

**TO THE HONORABLE INDUSTRIAL COMMISSION
STATE CAPITOL**

In accordance with your requirements,

I am transmitting herewith:

FINANCIAL STATEMENT OF

The State Insurance Fund

For the three years ending June 30, 1920, with

detail of the following accounts:

**PREMIUMS - LOSSES - RESERVES - EXPENSE
OFFICE EQUIPMENT - SURPLUS**

Our personnel follows:

CHARLES A. CAINE, Manager
WILLIAM LESLIE, Consulting Actuary
ALBERT W. GRIGGS, Accountant
J. LORIN HATCH, Payroll Auditor
ARTHUR W. COLLINS, Claim Adjuster
DR. CHARLES F. WILCOX, Medical Examiner
GEORGE B. SPAHR, Inspector
HELEN CORNELL, Policy and Payroll Adjustment Clerk
ANNIE E. RESSLER, Claim Clerk and Stenographer
GERTRUDE A. PETERSON,
Voucher Clerk and Stenographer
EMMA BENGE, Stenographer
ALDA SILCOX, Multigrapher.

STATEMENT OF THE STATE INSURANCE FUND OF UTAH

From July 1, 1917, to June 30, 1920.

DECREMENT		INCREMENT	
Return Premiums	\$ 80,139.01	State Appropriation	\$ 40,000.00
Deposit Premiums Returned ..	11,470.88	Premiums	643,802.34
Dividends Paid	32,814.89	Deposit Premiums	16,935.88
Benefits Paid	138,523.03	Interest	26,267.57
Expense	41,260.53	Interest Accrued	5,282.91
Office Equipment	2,544.13	Sec. 79: Non-dependents	1,500.00
Bond Premium and Discount ..	3,167.04	Compensation Unclaimed	30.93
Accrued Interest on Bond Pd. ..	2,584.63		
Bond Investments	372,900.00		
State Premiums — Monthly and Period Adjustments Out	22,794.77		
Accrued Interest Out	5,282.91		
Cash on Hand	20,337.81		
	<hr/>		<hr/>
	\$733,819.63		\$733,819.63
ASSETS		LIABILITIES	
Bond Investments	\$372,900.00	Gross Reserve	\$420,150.71
Office Equipment (20% De- preciation)	1,820.38	Benefit Paid	138,523.03
Accrued Interest	5,282.91	Reserve—Claim Maturities	\$281,627.68
Adjustments Out	22,794.77	Bills Payable	105.47
Cash on Hand	20,337.81	Deposit Premiums Returnable ..	5,465.00
		Compensation Unclaimed	30.93
		Sec. 79: Non-dependents	1,500.00
		Surplus	134,406.79
	<hr/>		<hr/>
	\$423,135.87		\$423,135.87

The increases for the year are \$123,605.36 in assets; \$25,848.05 in surplus; \$105,409.72 in reserves, and \$161,800 in investments.

The net premiums written for three years were \$563,663.33 and the gross expense 7.3 per cent.

The dividends of \$32,814.89 were paid on the first two years' business, but on account of reducing our multiplier from the stock company basis of 2.72 to the fund basis of 2.24, the additional saving to our policyholders for the third year was about \$44,700.

The net premiums written for the last year were \$209,009.73.

Anticipating \$70,000 premium receipts for July and August, and loan receipts of \$25,000 early in September, we reduced our cash balance to a minimum by purchasing \$36,000 Honeyville bonds June 30, thereby increasing to a maximum our interest-bearing investments.

Our interest income now exceeds our gross expense.
The bond investments are as follows:

Beaver City	\$ 6,000.00
Brigham City	40,000.00
Duchesne	14,000.00
Grantsville City	1,500.00
Hyde Park	8,000.00
Iron County School District.....	15,000.00
Koosharem	7,800.00
Richfield City	30,000.00
Spring City	5,000.00
Tremonton	40,000.00
Utah State Road	40,000.00
U. S. Liberty Loans, 2, 3, 4 and 5.....	45,000.00
War Savings Stamps	1,600.00
Washington County School District.....	8,000.00
Hurricane	14,000.00
San Juan County	36,000.00
State Board of Loan Commissioners on State Road Bonds (Due Sept. 1, 1920).....	25,000.00
Honeyville	36,000.00
	<hr/>
	\$372,900.00

Our claimants are given prompt and most equitable consideration and if the initial surgery proves inadequate, we immediately furnish the best possible additional surgical skill in our efforts to rehabilitate injured workmen.

The last report of the Insurance Commission shows that 19 stock companies doing business in this state wrote \$605,399.54 in Workmen's Compensation premiums for the year ending December 31, 1919, and as the State Insurance Fund wrote \$209,009.73 for the third year, it is doing 25 per cent of the business written by insurance carriers. Had we used the stock company multiplier of 2.72, our third year's premium would have been approximately \$253,700 or 29½ per cent of the total.

PREMIUMS WRITTEN

	1917-18	1918-19	1919-20	Total
General Classes	\$107,042.80	\$127,934.82	\$188,756.05	\$423,733.67
Coal Class	81,179.12	38,496.86	20,253.68	139,929.66
	\$188,221.92	\$166,431.68	\$209,009.73	\$563,663.33

LOSSES PAID

	Injuries 1917-18	Injuries 1918-19	Injuries 1919-20	Total
FIRST YEAR—				
Compensation	\$ 13,478.59			1st Year
Medical Exclusion	11,378.08			
Medical and Medicines..	1,938.70			
Hospital and Nurses....	969.00			
Funeral	866.50			
Loss Expense (n. o. c.)..	80.00			
	\$ 28,710.87			\$ 28,710.87
SECOND YEAR—				
Compensation	\$ 11,814.27	\$11,407.54		2nd Year
Medical Exclusion	424.92	6,922.84		
Medical and Medicines..	961.80	3,614.95		
Hospital and Nurses....	339.00	790.85		
Funeral	150.00	864.60		
Loss Expense (n. o. c.)..	80.00			
	\$ 13,769.99	\$ 23,600.78		\$ 37,370.77
THIRD YEAR—				
Compensation	\$ 8,106.66	\$ 8,917.80	\$33,545.40	3rd Year
Medical Exclusion		482.10	5,781.61	
Medical and Medicines..	57.13	1,240.32	9,788.32	
Hospital and Nurses....	137.87	388.03	2,551.70	
Funeral			750.00	
Loss Expense (n. o. c.)..	45.00	361.40	288.05	
	\$ 8,346.66	\$ 11,389.65	\$ 52,705.08	\$ 72,441.39
GRAND TOTALS	\$ 50,827.52	\$ 34,990.43	\$ 52,705.08	\$138,523.03

EXPENSE

	1917-18	1918-19	1919-20	Total
Salaries	\$ 8,005.33	\$10,855.60	\$14,912.00	\$33,772.93
Printing and Stationery	1,151.26	366.78	718.44	2,236.48
Telephone and Telegraph	18.90	57.10	86.55	162.55
Postage — Including Stamped Envelopes..	455.80	517.82	324.68	1,298.30
Traveling — Adjustments and Inspection	194.93	197.67	452.04	844.64
General Expense—				
Prem's on Custodian and Fund Emp. Bonds	255.72	497.14	517.39	1,270.25
Depreciation in Office Equipment	477.36	597.26		1,074.62
Supscription Dunn's Rating			125.00	125.00
Compensation Prem's Fund Emp.	35.11	51.43	41.10	127.64
Miscellaneous	21.83	91.24	235.05	348.12
	\$ 10,616.24	\$ 13,232.04	\$ 17,412.25	\$ 41,260.53

OFFICE EQUIPMENT

	1917-18	1918-19	1919-20	Total
Purchased	\$2,386.82	\$ 599.49	\$ 632.44	\$3,618.75
Depreciation	477.36	579.26		1,074.62
				\$2,544.13
Equipment per Statement.....		\$2,544.13		
Depreciation Third Year.....		723.75		
Shown in Assets		\$1,820.38		

DETAIL OF RESERVES

PREMIUMS	1917-18	1918-19	1919-20	Total
General Classes	\$107,042.80@65%	\$ 69,577.82		
Coal Class	81,179.12@75%	60,884.34		
General Classes	127,934.82@65%		\$ 88,157.63	
Coal Class	38,496.86@75%		28,872.65	
General Classes	188,756.05@85%			\$160,442.64
Coal Class	20,253.68@85%			17,215.63
GROSS RESERVES	\$130,462.16	\$112,030.28	\$177,658.27	\$420,150.71
LOSSES PAID	50,827.52	34,990.43	52,705.08	138,523.03
RESERVES FOR CLAIM MA- TURITIES	\$ 79,634.64	\$ 77,039.85	\$124,953.19	\$281,627.68

SURPLUS COMPOSITION

State Appropriation		\$ 40,000.00	
Statutory Requirement, First and Second Years@10%		35,465.36	
Statutory Requirement, Third Year@5%		10,450.49	
Interest Received and Accrued		28,965.85	
Expense Loading--Less Statutory Surplus		\$ 97,596.77	
Dividends Paid	\$ 32,814.89		
Expense Paid	41,260.53		
Bond Premium and Discounts	3,167.04		
Office Equipment	2,544.13		
Bills Payable	195.47	79,892.06	
Addition Expense Saved		\$ 17,704.71	\$ 17,704.71
Possible Dividends	\$ 41,230.44		
Dividends Paid	32,814.89		
Unapplied, account Cancellations and Withdrawals	\$ 8,415.55		
Balance Expense Loading	\$ 56,366.33		
Paid, except Dividends	47,077.17	\$ 9,289.16	\$ 17,704.71
Office Equipment, Less Depreciation			1,820.38
			\$134,406.79

Our risks are inspected semi-annually by us and we are affiliated with The Associated Companies Bureau for Coal Mine Inspection and Rating, and with The Industrial Commission on Coal Mines, Metal Mines, Industrials and Special Hazards.

As the reserves appear to be more than adequate to mature claims, the individual and class experience in detail for the first year will be completed later for submission to William Leslie, Consulting Actuary, for the setting up of specific reserves and determination of additional distributions to policyholders of that year.

Respectfully submitted,
CHARLES A. CAINE,
Manager, The State Insurance Fund.

THE INDUSTRIAL COMMISSION OF UTAH

FINANCIAL STATEMENT

July 1, 1918 - June 30, 1920

July 1st, 1918, Balance Cash on Hand	\$ 4,365.35
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Disbursements July 1, 1918 to March 31, 1919

Coal Mine Inspection	\$ 2,168.89
Express	2.25
General Inspection	1,840.28
General Expense	1,038.89
Labor, Conciliation and Arbitration	15.40
Metal Mine Inspection	1,139.51
Office Expense	136.56
Office Equipment	1,128.56
Postage	199.10
Referee Hearings	1,570.85
Salaries	19,255.60
Stationery and Printing	1,536.21
Telephone and Telegraph	264.02
Traveling Expenses	852.40
	<hr/> \$31,148.52

DEFICIT MARCH 31, 1919	\$26,783.17
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APPROPRIATION APRIL 1, 1919.....	\$96,600.00
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Disbursements April 1, to June 30, 1920

Board Arbitration and Conciliation	\$ 144.53
Commissioner's Salaries	15,000.00
Contingent Fund	3,174.09
Commissioner's Traveling Expenses	1,694.81
General Office Salaries	5,974.00
Inspection Department	17,358.59
Medical Advisors	242.51
Printing Department	4,733.53
Referee Hearings	5,320.47
Statistical Department	2,795.00
	<hr/> \$56,437.53

CASH ON HAND	\$40,162.47	\$96,600.00
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STATISTICAL DEPARTMENT

MRS. L. E. KING, Statistician.

Herewith are presented in tabular form statistics pertaining to workmen's compensation in Utah for the two years ending June 30, 1920.

During the fiscal year ending June 30, 1919, there were reported 73 fatalities, 3 permanent totals, 95 permanent partials and 8718 injuries, causing temporary disability or receiving medical attention. The waiting period for this year was ten days.

For the fiscal year ending June 30, 1920, were reported 99 fatalities, no permanent totals, 126 permanent partials and 9,958 cases causing temporary disability or receiving medical attention. The waiting period for this time was three days.

The following tables include an analysis of these injuries:

Table I, as to cause of injury by extent of disability.

Tables II and VI show the payroll exposure.

Tables III and VII show the payrolls, premiums and losses by industry classification.

Tables IV and VIII give the details as to dependency and cost in fatal cases.

Tables V and IX give a detailed analysis of all injuries causing permanent partial disability.

CAUSES BY EXTENT OF DISABILITY—TABLE I

REPORT OF INDUSTRIAL COMMISSION

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CAUSES	JULY 1, 1919, TO JUNE 30, 1920				JULY 1, 1918, TO JUNE 30, 1919			
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Temporary Injuries
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	
UNDERGROUND—METAL MINES								
Falls of rock or ore from roof or wall	5	3	3	20	33	63	156	2
HANDLING ROCK OR ORE								
Loading at face								
Loading at chute				3	11	11	24	
Sledging and picking		1	1	4	2	24	148	3
Timber or hand tools		1	1	15	23	52	84	1
EXPLOSIVES								
Charging and tamping	1			1				1
Drilling into old holes	1						1	2
Striking in loose rock or ore								
Chawing								
Caps, detonators, etc.								
Premature shot						4	1	1
Miscellaneous					1	5	9	1
Carbide lamp—explosion of					3			1
HAULAGE								
Hand and animal		4	4	16	36	38	83	3
Mechanical		1	1	2	1	4	8	1
Persons falling down chute, winze, raise or stope				3	2	12	27	8
Run of ore from chute or pocket					2	4	6	2
Drilling (by machine or hand drills)	2	1	1	37	17	18	150	1
								22
								33
								110
								76
								8
								15
								10
								6
								1
								6
								8
								24
								58
								12
								15
								2
								12
								33
								110

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	Permanent Total	Permanent Partial	JULY 1, 1919, TO JUNE 30, 1920				JULY 1, 1918, TO JUNE 30, 1919			
				Temporary Injuries				Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
ELECTRICITY											
Direct contact with trolley wire				1			1				
Tool or hand striking trolley wire											
Contact with motor											
Miscellaneous											
OTHER CAUSES											
Machinery other than motors and drills											
Mine fires	1				1		2		3		
Suffocation from natural gases											
Nail punctures, slivers, etc.				1		17	34		2		
Falls of persons			1	2	2	12	18		2	20	23
Other falling objects			1	3	2	17	26		4	4	10
Other flying objects					3	6	17		6	22	40
Burns					1	1	1		1	6	12
Strains from lifting											
Miscellaneous				10	12	28	29		2	11	18
Total underground	10		13	138	183	347	894		156	410	830
SHAFT ACCIDENTS											
Falling down shaft	3			6	6		21		2	7	5
Objects falling down shaft											
Breaking of cables	2			1					2	4	3
Overwinding											
Mistaken signals											

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919						
		Permanent Total	Permanent Partial	Temporary Injuries				Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
CAGE, SKIP OR BUCKET													
Runaway	1	1	1	1	1	1	1	1	2				
Riding with rock or ore					1	1						2	1
Riding with timber or tools	1				1				5	1	2	10	8
Struck by					6	8	4	15	1	2	3	23	17
Miscellaneous		2	1						13				
Total shaft	8				17	16	9	39	3				
SURFACE ACCIDENTS—PLANTS AND SHOPS													
HAULAGE													
Hand and animal				8	3	14	20		1	2		8	19
Mechanical		1	1	1		3	4		1				3
Railway cars and locomotives						1							
Run or fall of ore in or from ore bins												1	
Falls of persons				2	2	6	8		2	1	12	26	
Nail punctures and slivers					1	3	15			1	2	9	
Hand tools, axes, bars, etc.				2	1	8	34		4	3	6	26	
ELECTRICITY													
Tool or bar striking trolley wire									1			2	1
Contact with motor				1	1	2	9						4
Other, short circuits, etc.	1			3	1	3	36		4	4			20
Machinery, emery wheels, etc.													
OTHER CAUSES													
Falling objects				2	1	4	13		8	3			17

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	JULY 1, 1919, TO JUNE 30, 1920						JULY 1, 1918, TO JUNE 30, 1919					
		Permanent Total	Permanent Partial	Temporary Injuries				Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Flying objects				1			16						20
Burns						3	3					5	1
Snow slide							32					19	3
Miscellaneous					7	11	58			3	2	21	21
Total surface	3		5	20	17	58	190			20	22	73	169
OPEN PIT													
Falls or slides of rock or ore			1	8	7	17	12			6	13	46	21
EXPLOSIVES													
Charging					1	1						1	
Drilling into old holes												1	
Striking in loose rock or ore													
Caps, detonators, etc.					1	5	2			1	1	1	1
Unguarded shots	1							4					2
Returned too soon											1		1
HAULAGE													
Hand and animal													
Mechanical			1				3		1		4	3	9
Railway cars and locomotives				2	1	3	1					30	10
Steam shovel				3	3	13	5		3	3	8	12	12
Falls of persons				2	1	10	6		3	4	4	23	6
Run or fall of ore in or from bins									1		1	13	1
Other machinery				3	3	3	2					7	10

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	Permanent Total	Permanent Partial	JULY 1, 1919, TO JUNE 30, 1920				JULY 1, 1918, TO JUNE 30, 1919			
				Temporary Injuries				Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
ELECTRICITY											
Direct contact with trolley wire						1					
Tool or bar striking trolley wire						1					
OTHER CAUSES											
Hand tools				2	9	14	7	3	2	6	7
Falling objects other than falls or slides of rock or ore				1	5	15	11	4	2	17	19
Flying objects						16	10	1	1	11	17
Burns				1	1	7	2	2	1	4	3
Nails, slivers, etc.						7	2	1	1	1	11
Miscellaneous				3	4	14	21	2	6	21	17
Total open pit	1	2	2	22	36	127	56	28	44	186	147
ORE DRESSING AND MILLING											
HAULAGE SYSTEM											
Cars and motors				2	1	1	5	4	8	16	15
Mechanical conveyors					1	3	6	2	1	8	6
Railway cars and locomotives										5	2
Crushers, rolls and stamps	1	1	1	8	2	4	7	2	5	8	8
Tables, jigs, etc.				1	4	3	1	7	5	5	6
Other machinery, emery wheels, etc.				2	6	15	15	2	5	12	15
Falls of persons		1	1	8	13	11	11	12	13	23	17
Falling objects, cave-ins, etc.				1	2	7	5	9	10	29	15
Scalding (steam or water)					1			1	1	1	3
Electricity				2	1	4	3	1	1	5	3

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

JULY 1, 1919, TO JUNE 30, 1920												JULY 1, 1918, TO JUNE 30, 1919							
CAUSES	Death		Permanent		Temporary Injuries				Death		Permanent		Temporary Injuries						
	Total	Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	Total	Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	Total	Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	
Hand tools, axes, bars, etc.													1			4	6	13	8
Nails, slivers, etc.																2	1	23	21
Flying pieces of rock from sledging or crushing																1		11	16
Chemical burns																		4	2
Strains from lifting																		1	8
Flying particles																		4	4
Falling objects																		1	4
Miscellaneous																		8	6
Total ore dressing	1		5	33	37	109	129	3	4	56	73	205	188					26	33
SMELTER ACCIDENTS																			
Cars and motors				3	1	6	5											8	26
Mechanical conveyors				1	1	1	1											6	12
Railway cars and locomotives	1			3	1	1	1											15	6
Cranes				3	1	2	1							1				4	15
Other machinery				3	6	1	3											3	8
Falls of persons				3	2	6	8											2	3
Flying or falling objects				2	2	6	12											1	16
Gas burns or asphyxiation	2			4	2	4	12	2										11	16
Scalding (steam or water)														2				10	60
Electricity																		1	6
Hand tools, axes, bars, etc.																		1	2
Nails, slivers, etc.																		1	6
Burns from matte, slag or molten metal																		3	14
Hot metal																		5	3
Hot metal explosions	1			3	8	10	28											12	89
Acid burns				1	2	3	5											2	5
Strains from lifting				2	1		5											3	2

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919									
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries				
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	
Falling or rolling objects					1	1	1								
Flying objects, other					1	2	1							10	14
Miscellaneous					2	8	15							24	46
Total smelter	3		2	24	40	60	114	3	1	4	63	51	115	411	
AUXILIARY WORKS ACCIDENTS (Yards, Shops, Construction)															
Haulage systems, cars, motors, etc.					3	5	4							2	15
Railway cars and locomotives				1		1	6							2	15
Falls of persons			1		1	1	8							1	14
Falling objects (rocks, timbers, etc.)					3	2	6							1	3
Hand tools, axes, bars, etc.					3	4	25			1				1	8
Electricity					1	1	1			1				1	13
Machinery					1	2	5							1	1
Failure of ladder, scaffold or other support					1	1	1							1	23
Handling hot materials															
Flying objects															
Miscellaneous				6	1	3	9			1					
Total smelters auxiliary			1	7	13	26	71			2	9	22	27	8	38
COAL MINES															
Falls of coal at working face	4		1	36	29	48	141			5		39	16	79	162
Falls of coal in room or chamber	2		1	12	37	23	42			5		9	7	19	47
Falls of coal on road, entry or gangway	1			3	3	3	4			1		1	1	2	8
Falls of coal on slope	1						1			1					

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920							JULY 1, 1918, TO JUNE 30, 1919						
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
FALLS OF FACE OR PILLAR COAL														
Falls of coal at working face	3		1	17	22	28	71				10	7	40	28
Falls of coal on road, entry or gangway				4	2	2	5	1				1	1	3
MINE CARS AND LOCOMOTIVES														
Switching and straggling	2	2		8	21	29	48	1		1	3	16	22	39
Coupling cars				9	7	16	28			2	4	6	14	12
Falling from trips				1										2
Run over by car or motor or struck by	1			6	1	2	2	3		1	5	3	6	2
Caught between car and motor or car and prop					4	3	12			1	1	5	9	6
Caught between car and roof					4	3	8	1		1	1	6	11	3
Runaway car or trip				4	12	15	30				6	6	11	10
Loading cars				12	13	70	77			1	1	4	16	22
Collision		1			2	4	2	1			1	2	1	2
Caught between car and rib	1			6	9	28	34				19	6	29	53
Miscellaneous														
GAS EXPLOSION AND BURNING GAS														
Due to open light					1								1	1
Due to defective safety lamps												1	1	
Due to electric arc						1	4							
Due to shot				1							1			1
Due to explosions of powder						1	2						2	
Miscellaneous						2	8							1

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

[illegible]

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919								
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
OTHER CAUSES														
Falls of persons				6	9	20	38				6	3	11	24
Machinery, other				2		1	1				3		3	8
Rush of coal or gob				3							1		1	9
Falling timber				2	11	4	10		1		1	3	6	9
Strains from lifting				16	23	75	182				5	13	40	66
Hand tools set in motion by				1	1	4	21				2	1	7	15
Nails, slivers, etc.				6	12	27	70				5	7	39	71
Miscellaneous				176	250	474	907		16	146	126	393	652	
Total coal mines underground	25	12												
SHAFT														
Falling down shafts or slopes					1	1	2				1	1	2	
Objects falling down shafts	1													
Cages or skips														
OTHER CAUSES														
Overwinding														
Breaking of cables				1		1					1		3	4
Miscellaneous				1	2							2	4	11
Total coal mines, shaft	1													

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919							
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
SURFACE (Yards, Shops, Etc.)													
Mine cars and locomotives	1		1	3	5	14	14	1		1	7	2	14
Electricity	1		1	1	1	1	9	1					
Machinery, emery wheels, etc.				5	3	8	38		3	1	1	2	26
Boiler explosions or bursting steam pipes													
Railway cars and locomotives					1	3	5	1		1	1	1	3
OTHER CAUSES													
Explosives													
Falls of persons				1	3	7	22			1	1	5	12
Falling objects				4	2	5	17			6	1	7	10
Suffocation in chute, bin or culm													
Falls or slides of rock or culm					1	1	4					2	4
Steam shovel													
Hand tools			2		2	4	15		1		1	5	15
Nails, wires, etc.				1		1	17				1	3	7
Slips, trips, falling						1	6					3	4
Strains from lifting					4	23	62	1		2	11	16	66
Miscellaneous													
Total coal mines, surface	2		4	15	21	69	210	4		19	22	49	175
QUARRIES (In and About Quarry)													
Falls or slides of rock or over burden	4		1	3	1	1	1			1	1	1	
Handling rock at face			1	3	1	4	3						
Timber or hand tools				1		1	1						

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920				JULY 1, 1918, TO JUNE 30, 1919									
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
EXPLOSIVES														
Transportation														
Charging														
Drilling into old holes														
Striking in loose rock				1										
Thawing														
Caps, detonators, etc.														
Unsecured shots														
Returned too soon				1										
Premature shot														
Miscellaneous														
HAULAGE														
Hand and animal														
Mechanical														
Railway cars and locomotives														
Falling into quarry from surface benches or face														
Falling from hoists, derricks, ladders, etc.														
Drilling and channeling (by machine or hand) Electricity														
MACHINERY														
Cables and attachments														
Gears, shafts, booms, derricks and attach- ments				1	1	1	1						1	2

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

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CAUSES	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Pumps and hoisting engines														
Other machinery														
FLYING OBJECTS														
Sledging														
Nails, slivers, etc.														
Boiler and air tank explosions														
Steam shovels														
Miscellaneous														
OUTSIDE WORKS														
(To Include Rock Dressing Plants, Crushers, Cement Mills, Kilns, Etc.)														
HAULAGE														
Hand and animal														
Mechanical														
Railway cars and locomotives														
Crushers														
Cranes, derricks, etc.														
Other machinery														
Falls of persons														
Hand tools														
Electricity														
Nails, slivers, etc.														

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

JULY 1, 1919, TO JUNE 30, 1920															JULY 1, 1918, TO JUNE 30, 1919				
CAUSES	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries								
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days					
FLYING OBJECTS																			
From sledging or crushing				1	1		2				1	1	1	2					
Falling objects (rocks, timbers, etc.)				1			1						2	2					
Burns					2		2				2	1	19	27					
Handling rock by hand																			
Miscellaneous			5	19	13	26	20			2									
Total, quarries	1																		
COKE OVENS																			
Cars, carriers and motors										1		5	1	7					
Railway cars and locomotives							2			3		1	1	4					
Coke-drawing machines												1							
Electricity												2	1	3					
Falls of persons												1	2	3					
Hand tools																			
Suffocation from gases											1		1	2					
Burns																			
Explosions																			
Flying particles																			
Total, coke ovens			1				3			1	6	10	10	31					

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919				
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			
Animals, insects, etc.										
Asphyxiation, drowning, etc.										
Assault and fighting										
BELTING										
Shifting by stick or hand, etc.										
Caught between belt and pulley (not while shifting)										
Contact with running belt (not while shifting)										
Struck by breaking belt										
Replacing belt with stick										
Clothing caught, etc.										
Miscellaneous										
Boiler explosions										
BURNS										
Asphalt, pitch and tar, molten metal										
Chemical										
Fire										
Hot objects, steam pipes, etc.										
Steam, hot liquids, etc.										
Rusting steam pipes										
Miscellaneous										
Cold, etc., including frostbite										

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919				
	Death	Permanent Total	Temporary Injuries			Death	Permanent Total	Temporary Injuries		
			28 Days and Over	14 to 28 Days	4 to 14 Days			28 Days and Over	14 to 28 Days	4 to 14 Days
CRANES										
Breaking cable or chain				1					1	
Breaking hook				1						
Caught in moving parts				1						
Struck by load		1								
Struck on runway by moving crane				1						
Falls from										
Miscellaneous			1	1	2			1	1	6
Drills										
ELECTRICITY										
Flashes or short circuits			4		1			3	2	9
Shocks					2			1	1	4
Other generator and motor accidents					2			1	1	1
Direct contact with wire	3		2		1			1	1	1
Electric fans, etc.					1					
Miscellaneous										
ELEVATORS										
Caught in machinery			1						1	
Caught under car and shaft										
Caught underneath or on top of car										
Falling car, or struck by descending car			1		2					4
Falling down shaft (person)			1		1					2
Struck by falling object		1	4							4
Struck by falling object										
Stand or fingers caught in elevator chain		1	1		1					1

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919							
	Death	Permanent Total	Permanent Partial	Temporary Injuries			Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days				Under 4 Days	28 Days and Over	14 to 28 Days	4 to 14 Days
Caught between elevator and floor	1		1	1	3	1	1			1	1	1	1
Miscellaneous						11							4
EMERY WHEELS													
Bursting													
Caught between emery wheel and guard				2	1	1							
Miscellaneous					2	1	2				1	1	1
ENGINES													
Caught in or struck by moving part				2	1	1	6			1	1	3	1
Fly wheel bursting													
Cranking motors				1	1	2	2			2	4	1	1
Miscellaneous							9						1
EXCAVATING													
Blasting and drilling				4	2	1				4	2	1	1
Cave-in of ditches, tunnels, banks, etc.						3							
Miscellaneous													
EXPLOSIONS—(Other than Boilers)													
Handling and transportation of explosives				4	5	10				3	4	6	2
Gas or kerosene	1			1	1	2							
Compressed air				1	1	1							
Blasting				1	1	2							
Miscellaneous	2			1		1							

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919							
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Scaffolds and staging					1	3	4			1		2	6
Tramways and trestles												2	2
OBJECTS FALLING													
Into excavations										2	1	8	10
OTHER FALLING, ROLLING AND FLYING OBJECTS													
Objects tipping over (except vehicles)													
Trees, limbs, poles, etc., falling or rolling				3	8	13	36	1		4	4	10	18
Flying particles of dust, splinters, chips, sparks, etc., N. O. C.						3	9			5	2	4	6
Gates, doors or windows falling						13	3				2	3	16
Objects flipping up or rebounding				2	1	5	6	1		1	1	3	6
Trolley falling						4	4	1		1	1	2	7
Mechanical unloading device					1	2	1			1	1	2	1
Flying particles set in motion by motion of machine					1	1	4			2	2	3	3
Miscellaneous							2			1	2	5	12
FALLS OF PERSONS													
From benches, boxes, chairs, tables, machines, etc.				4	3	7	16			1	1	7	3
From fixed ladders				1	1	1	10			3	1	1	3
Into holes, pits, etc.				2	1	4	6			6	1	5	7

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919						
		Permanent Total	Permanent Partial	Temporary Injuries				Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days			28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Over obstructions				9	10	17	23		1	9	4	12	14
From permanent structures				5	4	2	1			4	2	1	3
From poles or trees, or poles or trees breaking				1				1					2
From buildings in construction or demolition											4		1
From cranes, derricks and hoists, in erecting and rigging										2		1	1
From or with portable ladders				3	2	2	5			2	3		2
From runways, balconies and platforms				5	4	4	6			5	3	5	8
From scaffolding, etc.	2			7	12	13	34			6	5	5	5
Slipping on floor level or wet surfaces				12	12	15	38			8	10	16	20
Slipping on ice				6	3	4	5			3	1	1	3
Stumbling					2	2	3			1	1	3	4
Down stairways				8	3	12	28			3	5	10	10
Through windows, roofs or walls	1			3	4	6	8			6	2	2	2
Falls due to slipping or overbalancing from heavy weight	1			20	20	31	50			11	11	14	32
Ladder slipping or breaking				6	3	2	6			5	4	6	10
Jumping				6	2	2	3			4	3	6	5
Miscellaneous				1	5	4	4			1	3	5	3
Gears, cogs, shaft	1	5		8	7	7	23	1	3	6	4	5	8
GLASS													
Bottles and miscellaneous, bottles exploding		1		3	2	10	40		1	2	1	8	18
Windows and doors					1	1	8					1	3
Miscellaneous					1	1	1				1	1	1

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920						JULY 1, 1918, TO JUNE 30, 1919							
	Death	Permanent Total	Permanent Partial	Temporary Injuries			Death	Permanent Total	Permanent Partial	Temporary Injuries				
				28 Days and Over	14 to 28 Days	4 to 14 Days				Under 4 Days	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
HAND LABOR														
Objects dropped while being handled			2	28	40	66	122			1	18	23	57	93
Objects breaking and dropping while being handled	1	1	1	2	5	13	13				5	3	4	18
Caught by material			1	10	10	11	47				4	3	6	36
Flying particles from hammering tools			1	1			5			1	7	6	6	16
Caught between object handled and another object			1		7	31	102			3	5	7	10	45
Strains from lifting, etc.				43	24	44	84				17	11	30	42
Glancing or slipping of tool				19	24	80	251			3	20	28	77	122
Breaking or coming apart of tool				1		5	10				1	1	12	17
Accidentally hit by tool or object in hands of another	3			7	5	17	32				2	6	5	23
Sheet metal, iron, steel or other castings				1	4	3	32				1	2	7	25
Rebounding or deflected objects				1	3	6	32				1	5	11	11
Striking against objects, scratching		1	1	6	20	51	96		2		14	23	62	76
Object set in motion by tool		1	1	2	5	14	18				1	1	4	25
Miscellaneous		1	1	5	13	16	18	1					3	
HOISTS														
Breaking parts														
Falling loads	1	1	1	2	2	6	9				1	1	3	2
Caught by hook or cable or chain				4	2	1	5				3	3	2	2
Miscellaneous, conveyors				1	3	4	8				1	1	3	3
Illness		2		2	2	2	7				1	3	3	3

REPORT OF INDUSTRIAL COMMISSION

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919								
	Death	Permanent Total	Permanent Partial	Temporary Injuries			Death	Permanent Total	Permanent Partial	Temporary Injuries				
				28 Days and Over	14 to 28 Days	4 to 14 Days				Under 4 Days	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Intentional violence to co-employees														
Intentional violence, all others														
LATHES														
Wood working														
Metal working														
Lighting														
Milling machines														
Shimmers														
Shears														
NAILS														
In boxes, barrels or objects														
On floor or ground														
Miscellaneous punctures, wires, hoops, etc.														
Planers														
Planing and feeding														
Portable tools (hammers and riveters)														
PRESSES														
Drill presses														
Printing														
Punch and drop														
Miscellaneous presses, automatic, etc.														

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919									
	Temporary Injuries					Temporary Injuries									
	Death	Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	Death	Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	
RAILROAD EQUIPMENT															
Caught in frogs, switches, etc.															
Coupling or uncoupling cars															
Falls from cars or locomotives															
Hoisting and conveying outfits															
Struck or run over by car or locomotive															
Collisions	2	1						3							
Defective brakes															
Falls N. O. C.															
Objects falling from cars (not in loading or unloading)															
Derrailment															
Miscellaneous	2														
Saws		6							4						
Shafting, set screws, couplings, etc.															
Shooting															
Slivers		2													
Steam shovel		1								2					
VEHICLES—(Animal Drawn)															
Collision with cars or engines															
Collision with other vehicles															
Overturning															
Falls from								1							
Struck by															

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

JULY 1, 1919, TO JUNE 30, 1920																JULY 1, 1918, TO JUNE 30, 1919					
CAUSES	Death	Permanent			Temporary Injuries					Death			Permanent			Temporary Injuries					
		Total	Partial	28 Days and Over	15 to 28 Days	4 to 14 Days	Under 4 Days	Total	Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	Total	Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days		
AUTOMOBILES																					
Objects falling from (not in loading or unloading)	1																				
Sudden stopping, starting or turning																					
Run over by																					
Run over by																					
Struck by singletree																					
Struck by doubletree																					
Miscellaneous																					
AUTOMOBILES																					
Collision with cars or engines	1																				
Collisions with other vehicles																					
Collision with stationary objects																					
Overtaking	1																				
Cracking																					
Struck by or run over by	2																				
Falls from																					
Miscellaneous																					
Tractors																					
BICYCLES																					
Collision with cars or engines																					
Collision with other vehicles																					
Collisions with stationary objects																					
Miscellaneous																					

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919								
	Death	Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days	Death	Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
HAND TRUCKS, WHEELBARROWS ETC.														
Truck passing over foot or feet				1	1	4	1				3	2	4	3
Collision with person or other trucks														
Collision with objects and overturning: derailment				4	2	8	12				1	2	3	4
Slipping or falling from runway or platform				1	4	4	4				1	1	2	2
Miscellaneous				3	4	3	9				1	1	3	1
Wood moulders, shapers, mortising, etc.					1	1	1				1	1	1	1
ACCIDENTS CAUSED BY MACHINERY PECULIAR TO SPECIAL INDUSTRIES														
Candy manufacturing			2	1	1	2	9				1	1	9	4
Chemical products machine				6	5	6	10				1	2	3	1
Laundry			1		1	1	1							16
Leather products			4	3	3	1	3			2		2	2	2
Meat grinding and cutting machine					1	1	6						1	1
Paper products, box manufacturing			1		4	1	3					1	1	1
Paper products, box manufacturing					1	1	3					1	1	1
Printing and book-binding (except presses)			2	1	2	3	15			12	6	4	4	9
Sugar manufacturing										1	1	1	1	1
Other food products														
Textile														
Cracker machines				1	1	1	6				1	1	1	1
Mixing and kneading machines.				1	3		4				1	1	2	2

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSES	Death	JULY 1, 1919, TO JUNE 30, 1920					JULY 1, 1918, TO JUNE 30, 1919					
		Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	Under 4 Days	Death	Permanent Total	Permanent Partial	28 Days and Over	14 to 28 Days	Under 4 Days
Machines used in meat packing and provision companies												
Weaving machines			1			1						1
Buffing and grinding machines						1						
Bottling under pressure					1	1						
Labeling machines					1	1						
Box manufacturing, wood					2	3						
Canning		1				2						
Can manufacturing						3						
Knitting machines						1						
Multigraph and addressograph						1						
Cement mixers		1		1	3	1		1				
Miscellaneous		1				1						
STREET RAILWAYS												
Caught between cars (other than while coupling)												
Collision between car and vehicles												
Collision between cars				2	1	4			1			
Coupling cars			1									
Deraiment												
Falls from cars (other than off running board)												
Frogs, guard rails, switches, etc. (foot caught)				1		2						
Running boards (lost hold)						1						
Running boards (struck by obstruction)												
Struck or run over by car				1	2				1			
Track work, handling rails, etc.						2						

CAUSES BY EXTENT OF DISABILITY—TABLE I—(Continued)

CAUSE	JULY 1, 1919, TO JUNE 30, 1920							JULY 1, 1918, TO JUNE 30, 1919						
	Death	Permanent Total	Permanent Partial	Temporary Injuries				Death	Permanent Total	Permanent Partial	Temporary Injuries			
				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days				28 Days and Over	14 to 28 Days	4 to 14 Days	Under 4 Days
Objects falling from (not in loading or unloading)				1	1	2	4							2
Strains from lifting				1	1	3	9					1	2	2
Miscellaneous				12	13	20	64			1	6	6	5	17
All other	3							2						
GRAND TOTAL, ALL INDUSTRIES (excluding mines, smelters, etc.)	39		76	487	546	1038	2795	25		42	357	377	918	1730

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
4 Florida	51	\$ 19.80	\$ 48.00	\$ 113,277.00	\$.44	\$ 498.42
6 Farm Labor	25	28.00	37.00	18,218.00	.97	176.71
50 Threshing Machines	18	28.00	48.00	3,204.00	5.25	16.82
250 Irrigation Works and Operation	168	18.00	48.00	95,871.00	2.80	2,684.36
1001 Coal Mining	4320	34.34	93.21	8,578,606.00	7.81	669,989.13
1140 Metal Mining	5300	31.08	55.14	7,564,311.00	4.85	366,869.08
1200 Shale or Clay Mining	72	22.20	61.20	114,675.00	4.04	4,632.87
1410 Assaying	50	31.68	44.88	87,049.00	1.83	1,592.99
1430 Lead Smelting	1523	23.94	72.36	2,382,877.00	4.23	100,795.70
1441 Copper Smelting	1077	19.20	72.36	1,806,890.00	2.54	45,887.39
1452 Concentration and Amalgamation	1843	32.04	63.90	2,296,881.00	4.04	92,793.99
1478 Coke Manufacturing	176	19.50	62.30	288,056.00	5.43	11,740.83
1492 Quarrying	173	23.08	57.88	254,555.00	3.86	10,000.00
1640 Cement Manufacturing	43	23.10	67.90	54,655.00	3.19	1,743.49
1701 Cement Manufacturing (no quarrying)	280	18.18	86.22	440,822.00	2.78	12,264.85
1703 Plaster Manufacturing (no quarrying)	41	22.60	40.40	35,614.00	2.78	988.62
1744 Talc Mills (no quarrying)	2	36.00	50.40	4,000.00	2.83	73.20
1863 Stone Dressing (hand work)	43	22.38	116.58	37,932.00	2.10	796.55
2000 Bakeries	315	18.18	38.52	242,628.00	1.29	3,129.92
2002 Macaroni Manufacturing	22	9.00	42.00	10,008.00	1.61	162.58
2011 Flour Mills	95	26.28	56.64	180,778.00	2.10	2,746.34
2014 Millers N. O. C.	15	23.88	47.28	15,584.00	1.73	269.78
2030 Beet Sugar Manufacturing	2324	24.84	108.78	2,610,195.00	2.00	52,203.90

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
2040 Ice Cream Manufacturing	136	13.32	36.00	79,982.00	1.91	1,527.66
2041 Candy Manufacturing	876	10.56	60.42	594,845.00	.86	3,925.98
2050 Coffee Roasting and Grinding	4	21.60	31.98	1,568.00	.88	13.78
2062 Condensed Milk Manufacturing	148	12.00	36.90	153,686.00	1.02	1,567.60
2063 Creameries and Dairies	179	16.74	38.52	171,836.00	1.02	1,767.42
2081 Slaughtering of Live Stock (including handling)	59	28.08	34.32	80,599.00	4.04	3,256.20
2090 Packing Houses	281	15.96	44.58	208,107.00	1.53	4,714.04
2102 Sausage and Sausage Case Manufacturing (no box manufacturing)	56	30.00	37.26	40,209.00	1.53	615.20
2105 Fruit Evaporating	23	12.00	35.07	17,472.00	1.07	186.95
2106 Fruit Packing (no box manufacturing)	10	10.20	34.32	5,442.00	.93	50.61
2110 Pickle Manufacturing	36	14.34	39.18	10,360.00	1.40	145.04
2111 Canneries	933	14.22	50.64	640,539.00	1.40	8,967.55
2112 Fruit Preserving	9	7.20	30.00	10,105.00	.80	80.84
2121 Breweries (including, ice manufacturing)	74	27.12	38.52	71,790.00	2.21	1,652.86
2131 Cider Manufacturing	1	28.80	33.60	668.00	1.61	10.75
2140 Ice Manufacturing	77	24.66	48.24	104,041.00	3.06	3,183.65
2161 Bottling Under Pressure	28	19.02	36.00	16,656.00	3.68	590.86
2162 Clear and Cigarette Manufacturing	11	11.38	35.00	33,298.00	.81	164.35
2244 Wool Spinning	11	13.00	32.00	12,200.00	1.40	168.88
2246 Wool Spinning	71	8.10	35.70	5,284.00	1.74	402.41
2362 Knit Goods Manufacturing (including Yarn Manufacturing)	132	9.42	29.22	76,563.00	.36	275.53
2363 Knitting Mills	94	7.20	21.60	14,628.00	.53	77.53
2501 Clothing Manufacturing	279	11.52	42.12	234,407.00	.25	586.02

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH
July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
2503 Dressmaking	9	20.00	40.00	8,517.00	.25	21.29
2521 Shirt Manufacturing	35	9.60	46.20	29,345.00	.28	56.97
2520 Mattress Manufacturing (no spring, wire or excelsior manufacturing)	41	19.20	135.00	34,708.00	1.07	371.38
2570 Awning and Tent Manufacturing	21	15.60	29.58	14,651.00	.74	108.42
2581 Laundries N. O. C.	820	10.62	50.76	547,068.00	1.23	6,728.94
2583 Dyeing and Cleaning	41	11.40	71.10	47,043.00	1.23	578.53
2660 Boot and Shoe Manufacturing	128	18.90	46.80	170,904.00	.42	717.80
2681 Harness and Saddle Manufacturing	47	7.44	50.16	68,625.00	.69	473.51
2702 Logging and Lumbering	63	18.00	45.00	73,821.00	5.56	4,104.45
2712 Excelsior Manufacturing	2	21.60	21.60	1,144.00	5.83	66.70
2731 Pining and Moulding Mills	182	30.30	34.14	26,415.00	2.54	6,462.14
2732 Picture Frame Manufacturing	76	19.50	33.00	5,804.00	1.84	77.77
2745 Cooperage (wood flow line construction)	3	22.50	52.20	50,330.00	2.21	1,115.71
2760 Trunk Manufacturing—Wood (manufacturing shooks)	12	7.20	36.00	4,387.00	3.36	161.65
2763 Box Manufacturing	7	23.04	23.04	9,584.00	1.61	89.90
2767 Box Manufacturing (wood assembling)	2	25.00	25.00	2,500.00	2.21	56.97
2804 Carpentry	22	21.90	56.40	13,531.00	2.21	299.04
2811 Cabin and Casket Manufacturing	28	16.02	35.40	39,551.00	.77	301.54
2812 Furniture Manufacturing	22	21.60	28.461.00	28,461.00	1.48	421.22
3000 Steel Works (open hearth)	80	21.60	72.00	64,699.00	3.68	2,850.92
3015 Rolling Mills (bars only)	162	21.60	72.00	265,340.00	2.43	6,399.16
3030 Steel Shop (fabricating, assembling, etc.)	21	24.24	51.90	21,228.00	3.68	781.19

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Weekly Minimum Wage	Average Weekly Maximum Wage	Payroll	Rate	Premium
3041 Iron and Steel Works (shop) manufacturing ornamental brass, bronze, and iron work exclusively, no blast furnace, converter or casting of steel or rolling mill)	16	18.00	36.00	21,766.00	1.94	422.26
3055 Tinmith Shop						
3056 Sheet Metal Works (shop only)	8	9.30	45.12	9,830.00	1.53	150.40
3053 Foundries N. O. C.	146	16.08	46.32	159,236.00	1.53	2,436.16
3107 Blacksmithing (not shoeing)	86	21.12	56.64	105,739.00	1.61	1,702.40
3107 Tag, Check and Label Manufacturing	26	32.70	41.82	33,372.00	2.02	674.11
3172 Stove Manufacturing (not sheet iron works)	9	12.00	66.00	13,760.00	.96	132.10
3172 Gas and Electric Fixtures Manufacturing	8	18.00	26.00	6,436.00	1.23	132.29
3176 Stamping Metal	18	7.20	39.00	17,117.00	1.14	135.93
3209 Tin Can Manufacturing	123	9.24	62.04	121,232.00	2.21	2,679.23
3301 Matt. Can Manufacturing	9	22.94	22.94	11,885.00	1.53	181.84
3350 Oxy-Acetylene (including cutting and welding)	4	25.20	25.20	5,893.00	2.92	172.08
3353 Jewelry Manufacturing	18	13.20	60.00	26,184.00	.45	117.83
3565 Typewriter Repair	7	14.40	33.00	7,911.00	.45	35.60
3567 Adding Machine Repair	10	20.40	48.00	14,548.00	.45	65.47
3620 Boiler Making	28	28.26	36.90	43,259.00	2.92	1,263.16
3631 Machine Shops (with foundry)	362	14.04	56.32	305,440.00	1.61	4,917.58
3631 Machine Shops (without foundry)	142	25.20	51.60	191,582.00	1.40	2,682.15
3643 Electric Apparatus Manufacturing	35	22.20	54.12	28,802.00	1.07	308.18
3681 Repairing Telegraph and Telephone Apparatus	10	16.14	27.72	8,554.00	.45	38.49
3724 Millwright Work	144	37.02	52.14	145,893.00	2.32	3,384.72

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
Boilers (Steam)—Installation and repair	8	45.60	55.60	3,911.00	4.23	165.44
Automobile Top Manufacturing	15	38.40	42.00	19,609.00	7.4	145.11
Automobile Radiator Manufacturing	6	4.80	45.00	6,439.00	1.61	110.11
Automobile Body Manufacturing (including assembling)	24	21.60	36.00	31,307.00	1.02	319.33
Bicycle Body Manufacturing	4	25.00	30.00	4,416.00	.98	4.07
Motorcycle Parts Manufacturing (including assembling)	2	24.00	34.50	1,763.00	1.13	19.92
Motorcycle Parts Manufacturing	2	14.40	41.64	9,789.00	1.94	189.91
Carriage and Wagon Manufacturing	13	21.00	35.00	10,864.00	1.94	210.76
Wagon Manufacturing	164	33.56	59.10	34,042.00	4.04	1,375.29
Sand and Gravel Digging (no excavating, grading or blasting)	302	16.32	35.70	260,832.00	1.83	4,773.23
Brick Manufacturing (no underground mine)	26	27.00	48.48	10,795.00	1.29	139.26
Tile Manufacturing (roof and drainage)	8	23.76	40.26	6,750.00	.93	62.78
Concrete Block Manufacturing	4	33.28	39.24	7,099.00	.74	52.53
Mirror Manufacturing (no glass making)	9	12.00	36.00	10,023.00	.74	74.17
Optical Goods Manufacturing (N. O. C.)	17	7.20	36.00	19,236.00	.74	142.35
Eye-glass and Spectacle Manufacturing	88	8.10	48.00	56,835.00	1.40	736.97
Box Manufacturing (solid paper boxes, no paper or board manufacturing)	42	9.60	56.50	24,384.00	1.40	339.78
Box Manufacturing (folding paper boxes, no paper or board manufacturing)	11	9.60	30.00	3,348.00	.44	31.70
Envelope Manufacturing	28	11.82	62.00	268,246.00	.64	1,716.70
Printing (no division of payroll)	13	1.80	54.219	54,219.00	.64	347.00
Lithography	68	3.60	51.60	401,553.00	.45	1,808.34
News-paper Publishing	511	10.88	60.60	401,553.00	.45	1,808.34
Bookbinding (no division of payroll)	87	8.28	44.22	82,674.00	.31	266.29
Engraving N. O. C.	8	36.00	48.00	9,677.00	.55	53.22

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Rate	Payroll	Premium
4361 Photograph Studios	22	8.40	42.00	14,580.00	.28	40.82
4362 Motion Pictures (film exchange)	67	13.30	60.00	81,079.00	.69	559.45
4418 Rubber Stamp and Pad Manufacturing	3	9.60	46.20	3,487.00	1.34	46.73
4524 Chemical Manufacturing (making potash salts and alumina from alunite)	195	26.10	75.24	288,562.00	2.67	7,704.61
4534 Salt Manufacturing	329	24.98	56.04	502,819.00	2.68	13,475.55
4551 Lead Manufacturing (white)	3	24.00	75.00	4,846.00	2.92	141.56
4558 Paint Manufacturing (no lead manufacturing)	10	17.40	27.30	8,737.00	1.94	163.60
4621 Flavoring Extract Manufacturing	6	35.00	35.00	3,600.00	1.34	98.24
4692 Oxygen and Hydrogen Manufacturing	6	22.00	35.00	3,526.00	3.68	26.14
4693 Pharmaceutical Manufacturing	12	43.20	43.20	12,550.00	.61	75.66
4693 Photographic Chemical Goods Manufacturing	15	9.60	17.40	3,459.00	.21	21.10
4716 Lard Refining (cucking houses)	14	9.00	28.00	5,964.00	2.21	65.50
4720 Soap Manufacturing	4	12.00	42.00	1,393.00	1.53	21.31
4740 Oil Refining (petroleum)	486	12.00	92.00	643,079.00	1.67	10,572.42
4741 Tar Manufacturing	8	25.20	75.00	5,163.00	1.83	94.48
4921 Photographic Sensitive Films and Dry Plates (development of negatives only)	7	6.48	30.00	3,452.00	.74	25.54
4970 Artificial Limb Manufacturing	4	24.00	40.00	6,032.00	.93	56.10
5022 Masonry N. O. C.	79	39.00	67.86	65,001.00	5.56	3,614.06
5025 Silo Erection (brick, tile, concrete block, frame, etc.)	8	46.54	55.77	4,770.00	5.56	265.21
5040 Iron Work (erecting steel and iron, not bridges)	13	40.80	62.28	5,008.00	13.34	668.07
5048 Tank Erection (metal) N. O. C.	13	57.60	68.40	1,928.00	11.08	213.62

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
5081 Oxy-Acetylene Cutting and Welding	2	48.00	48.00	2,500.00	4.94	101.00
5100 Work (contractual, within buildings)	6	7.34	116.07	6,092.00	3.36	204.72
5160 Elevator Installation (passenger or freight)	18	19.80	32.40	13,606.00	2.43	330.63
5181 Furnace Installation	5	19.80	32.40	3,961.00	1.23	48.73
5182 Gas, Steam and Hot Water Apparatus Fitting (including installation of ventilating plants, shop and outside)	82	20.88	49.38	77,342.00	1.23	951.31
5183 Plumbing (including house connection)	117	24.36	52.44	150,446.00	1.23	1,850.49
5184 Steam Pipes (applying cork or other non-conducting materials to same)	117	24.36	52.44	434.00	1.23	5.34
5188 Automatic Sprinkler	6	28.80	50.40	7,426.00	2.32	172.28
5190 Electrical Equipment (installation and repair)	85	28.44	51.12	106,457.00	1.29	1,373.30
5204 Concrete Work—Buildings (not grain elevators, no blasting)	262	29.46	34.50	243,261.00	5.56	13,525.31
5206 Concrete Work (grain elevators)	124	54.00	51.00	182,155.00	5.56	10,127.82
5208 Concrete Work—Buildings (not grain elevators, no blasting)	23	30.00	50.00	24,625.00	5.56	1,969.15
5209 Concrete Work (foundations for buildings)	99	28.08	42.90	96,456.00	3.68	3,512.78
5210 Concrete Work (retaining walls, no tunnelling)	136	28.32	51.00	51,835.00	3.88	1,907.53
5241 Marble and Stone Setting (inside only)	2	18.00	43.20	3,008.00	.85	125.57
5242 Tile Installation	12	25.14	41.82	16,165.00	1.23	175.90
5401 Carriery Work—Interior, not fireproofing	460	38.00	53.00	299,571.00	5.56	16,526.82
5402 Carriery Work—Exterior, not fireproofing	136	38.00	53.00	149,571.00	3.92	7,115.14
5403 Glaziers (installation of interior trim)	17	24.78	38.04	18,275.00	3.95	15.32
5404 Glaziers (away from shop)	17	24.78	38.04	18,275.00	5.56	15.32
5473 Plastering (outside of buildings) N. O. C.	4	39.60	52.80	104,651.00	4.04	4,227.90
5474 Plastering and decorating (away from shop)	93	36.06	46.02	104,651.00	4.04	4,227.90
5480 Plastering (interior work away from shop) N. O. C.	65	28.68	52.62	72,305.00	2.21	1,597.96

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
5490 Painting and Decorating	25	36.60	43.56	28,563.00	1.61	495.86
5491 Paper Hanging	18	30.18	43.62	16,866.00	1.29	458.83
5502 Concrete Work—Pavement (artificial stone or concrete)	382	32.80	45.06	285,612.00	1.61	4,538.35
5503 Asphalt Laying (street or sidewalk, including yard and shop)	124	19.20	49.50	111,368.00	1.61	1,793.02
5543 Tinsmithing (away from shop)	6	17.22	45.06	8,868.00	5.31	470.89
5545 Roofing, N. Systems (installation)	24	24.00	46.50	2,058.00	5.31	480.71
5600 Jobbing Work (on buildings, not residences)	5	10.00	50.00	5,117.00	2.32	143.35
5601 Additions, Alterations and Repair (existing buildings or plants)	13	20.88	60.00	11,711.00	6.10	313.97
5602 Contractors, Watchmen, Timekeepers and Cleaners	18	21.60	38.04	31,118.00	2.54	2,837.46
5604 General Contractors, Officers, Superintendents, etc.	58	17.46	31.82	68,717.00	3.36	1,046.56
5606 Jobbing Work (private residences exclusively)	29	36.00	37.50	5,652.00	3.52	198.95
5642 Contracts, Masonry, Concrete, Carpentry, etc.	264	25.20	46.38	161,930.00	2.32	3,756.78
5643 Contracts, Interior Trim and Cabinet Making	167	37.92	53.82	185,734.00	1.94	2,633.24
5644 Contracts, Cellar Excavations	54	24.12	28.08	15,977.00	2.32	370.67
5701 Wrecking (not marine, no blasting)	6	23.10	23.10	798.00	14.62	116.60
6030 Surveying and Inspecting Engineer Works	68	46.02	47.52	47,282.00	.69	326.24
6041 Grading Land (no canal or cellar excavation)	85	30.42	46.50	130,107.00	2.02	2,622.16
6042 State or Municipal Road or Street Making	1240	25.80	59.52	884,876.00	2.43	21,602.49
6104 Railroad Construction (electric, horse)	401	23.70	82.08	339,327.00	3.68	12,483.23
6200 Diamond Drilling	17	31.77	45.36	26,026.00	1.94	504.89
6202 Oil Producing (excluding the shooting of wells)	82	12.00	25.20	30,801.00	4.23	1,502.88
6220 Cellar Excavation (retaining walls, etc., no blasting)	74	26.58	56.76	46,476.00	5.83	2,705.35

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH
July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
6225 Ditch Digging (no blasting)	348	24.84	42.12	167,509.00	2.43	4,070.47
6227 Cellar Excavation (no caisson or subaqueous work and no blasting), depth 12 feet	19	24.75	29.75	11,804.00	3.52	415.50
6229 Irrigation Work (construction, including extension of laterals)	10	25.00	40.00	7,100.00	2.43	172.53
6280 Blasting (including the manufacture of powder)	79	27.96	34.14	136,202.00	17.54	23,944.31
6300 Sewer Building (no limit of depth)	43	25.80	31.18	9,875.00	7.00	691.25
6320 Steam Heating	3	40.38	55.20	3,598.00	2.43	87.43
6321 Waterworks (no tunneling or blasting)	123	22.50	29.70	28,021.00	3.85	1,078.81
6340 Irrigation Work (pipe laying)	2	27.00	36.60	900.00	3.85	34.65
6361 Canal Construction (excluding large canal)	21	16.80	69.60	19,371.00	5.07	982.16
7101 Steam Railroad Operations (all other employees)	18	29.40	87.78	28,930.00	6.18	1,787.87
7102 Railroad Operations (steam)	17	39.50	50.40	6,605.00	2.21	972.44
7103 Shop Employees (light and traction companies)	5	44.40	86.00	32,022.00	1.61	145.97
7127 Railroad Operations (street railways)	559	19.32	97.80	814,906.00	1.61	13,119.99
7201 Livery and Boarding Stables	4	16.80	50.40	6,402.00	2.54	182.61
7203 Drivers and Drivers, Helpers N. O. C.	505	24.12	83.00	534,232.00	1.67	8,921.67
7214 Coal Merchants (receiving or shipping by land or water where no conveyances are used for loading)	31	25.86	25.86	39,011.00	2.32	905.06
7215 Breweries (with or without bottling)	3	24.90	43.80	2,555.00	2.02	51.16
7216 Ice Manufacturing (drivers and drivers' helpers)	1	20.00	30.00	1,000.00	3.52	35.20
7219 Truckmen	131	29.82	41.94	146,204.00	3.06	4,473.84
7340 Refrigerator Cars (loading and unloading)	9	30.00	75.00	11,332.00	4.04	457.81
7380 Chauffeurs and Chauffeurs' Helpers (commercial) N. O. C.	2336	27.18	38.70	1,846,931.00	1.40	25,857.03

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
7388 Breweries—With or Without Bottling (chauffeurs and chauffeurs' helpers)	2	21.60	36.00	2,261.00	2.02	45.67
7389 Ice Manufacturing (chauffeurs and chauffeur's helpers)	3	22.50	33.00	2,669.00	3.52	93.95
7500 Gas Works (installation, inspection and repair)	29	23.02	44.58	30,968.00	1.83	566.71
7530 Waterworks (operation only, no construction work)	131	18.48	21.90	168,943.00	1.34	2,263.84
7530 Electric Light and Power Line Construction (transmission lines, not for local distributors)	566	22.20	75.00	575,065.00	4.63	26,625.51
7531 Electric Light and Power Companies (operation, maintenance and extension of lines)	100	23.04	49.50	51,538.00	4.63	2,386.21
7532 Electric Light and Power Companies (operation, maintenance and extension of lines), (not local distributors)	56	25.02	57.78	71,226.00	4.63	3,297.76
7535 Electrical Apparatus (erection and repair work only)	25	21.06	61.38	42,270.00	1.40	591.78
7570 Steam Heating or Power Companies (not electric, operation of plant only, no construction)	26	19.26	42.78	38,064.00	2.32	883.08
7600 Telegraph and Telephone Companies (operation, maintenance, extension of lines and light connections)	505	19.50	40.86	616,845.00	2.78	17,148.29
7703 City Firemen	150	23.40	55.62	144,570.00	4.23	6,115.31
7720 Butcherment Stores	227	21.00	55.20	295,950.00	2.78	5,725.41
8000 Butcherment Stores	772	10.38	134.56	668,603.00	3.86	2,406.97
8003 Butcherment Stores (meat or provision stores)	257	22.26	40.62	340,254.00	.85	2,892.16
8005 Groceries (retail)	108	12.12	26.40	111,328.00	.42	467.68
8007 Dry Goods Stores (no manufacturing)	548	8.52	58.98	563,316.00	.17	957.64
8008 Clothing Stores (retail, no manufacturing)	294	13.98	54.36	383,673.00	.17	618.24

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
8009 Clothing Stores (wholesale, no manufacturing)	28	9.30	85.50	23,547.00	.31	73.00
8010 Hardware Stores	143	12.72	41.54	162,993.00	.47	766.07
8011 Jewelry Dealers (wholesale or retail)	60	22.86	46.92	127,760.00	.17	217.19
8012 Furniture Dealers (store only)	352	20.40	55.86	450,491.00	.64	2,883.14
8013 Store Risks (wholesale) N. O. C.	477	19.92	53.64	584,170.00	.50	2,920.85
8017 Fish, Oysters and Poultry Dealers	8	24.00	36.00	10,034.00	.85	85.29
8025 Store Risks N. O. C.	1963	13.32	42.30	1,993,654.00	.31	6,160.33
8030 Delivery Stores	4	11.00	15.00	2,934.00	.42	12.32
8036 Five or Ten-Cent Stores or Stores Advertising Goods at a Maximum or Minimum Price	95	6.98	75.00	65,640.00	.36	236.30
8104 Seed Merchants (including operation of seed sorting machinery)	61	20.76	42.00	61,180.00	.50	320.90
8103 Seed Merchants (including warehouse)	10	25.20	43.00	9,700.00	.85	292.16
8104 Store Agricultural Implements	23	27.06	43.28	29,711.00	.85	292.16
8105 Leather and Shoe Finding Dealers	21	16.98	31.38	26,819.00	.50	134.10
8107 Machinery Dealers (store only)	51	27.66	140.64	84,530.00	.85	718.51
8111 Plumbers' Supply Dealers (no manufacturing, shop only)	45	19.20	31.20	67,043.00	.85	569.87
8200 Paper Stock and Rag Dealers	20	12.00	37.00	22,402.00	3.52	788.55
8203 Ice Dealers (including storing and harvesting)	94	25.38	46.98	58,971.00	3.52	2,075.78
8207 Lumber Yards (including storing and harvesting)	331	20.04	41.76	328,098.00	1.75	5,741.72
8212 Bottle Dealers (commercial only, not mill hazard)	9	24.00	31.80	8,961.00	1.67	149.67
8215 Hay, Straw and Feed Dealers	8	18.00	36.00	4,321.00	1.40	60.49
8217 Flour Dealers (no milling)	22	25.20	38.00	28,636.00	1.40	400.90

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Minimum Weekly Wage	Payroll	Rate	Premium
8222 Coal Merchants (receiving or shipping by land, no power machinery involved)	155	22.14	39.58	173,803.00	2.32	4,082.23
8224 Fuel and Material Dealers (coal, ice, kindling or firewood)	99	23.16	34.44	113,221.00	2.32	2,626.73
8226 Feed and Material Dealers (lumber, hay, grain, feed, agricultural implements, etc.)	26	20.88	36.00	22,382.00	1.75	391.69
8227 Contractors' Equipment and Material	31	33.60	56.50	19,519.00	1.75	341.58
8260 Junk Dealers (shop and outside, no wrecking of buildings, no blasting)	9	21.60	28.80	9,966.00	7.33	730.51
8269 Sales Stables (including exhibition and delivery of horses)	1	20.17	20.17	1,949.00	8.03	154.35
8281 Live Stock Commission Merchants and Salesmen	6	41.28	100.38	18,735.00	4.10	772.55
8285 Stock Yards (with or without railroad yards or slaughtering)	24	22.02	31.32	25,734.00	6.49	1,789.37
8291 Cold Storage (warehouse operation)	128	21.00	47.00	5,493.00	2.54	150.72
8292 Storage (general merchandise) N. O. C.	14	27.60	66.00	161,115.00	2.02	3,254.54
8301 Grain Elevators (line or terminal operation)	7	14.40	115.20	23,881.00	2.54	606.63
8306 Oil Distributing	1,093	18.90	75.12	10,000.00	2.43	243.00
8309 Automobile Dealers (with or without garage)	62	22.92	60.24	1,327,498.00	.93	12,349.45
8320 Rubber Tire Dealers (sale, repair and vulcanizing)	5	15.00	35.00	94,190.00	.93	875.97
8361 Automobile Accessories (accessories, spare parts, tires, etc.)	6	21.00	33.00	5,150.00	.83	47.90
8400 Gasoline and Oil Supply Stations (supplying autos and motor boats)	2	46.62	76.62	6,825.00	.55	37.54
8720 Insurance and Mercantile Manufacturing and Marine Risks (for Insurance and Valuation Purposes)	5	13.50	60.00	5,918.00	.15	8.88
8741 Real Estate Agencies Employees (outside of office, no construction)	2,327	28.68	48.42	3,391,586.00	.15	5,087.38
8742 Salesmen, Collectors and Messengers (outside, not using autos)	18	22.20	24.90	7,968.00	2.02	160.95
8745 News Agents						

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
8746 Photography (outside work, not producing moving pictures).....	1	31.25	31.25	750.00	.55	4.13
8810 Clerical Office Employees.....	7,375	19.08	53.28	10,829,873.00	.09	9,746.89
8830 Asylums, Hospitals, Professional Employees.....	402	23.64	70.68	467,588.00	.47	2,197.66
8832 Dentists (all other employees).....	16	32.40	105.00	37,035.00	.47	174.06
8860 Teachers, Agricultural, Domestic, Science and Manual Training.....	428	28.86	49.62	501,596.00	.15	752.39
8861 Teachers N. O. C.....	1,416	15.30	69.00	1,162,319.00	.09	1,046.09
8862 T. M. C. A. Teachers and Preachers.....	4	33.74	45.75	7,417.00	.09	6.68
8901 Telegraph and Telephone Companies (office and exchange employees only).....	1,167	12.12	62.34	938,206.00	.50	1,407.31
9001 Buildings, Office or Mercantile—Contractors for Janitor Work.....	87	15.60	28.38	36,439.00	.96	349.81
9007 Office Buildings—Employees, except professional help, drivers and chauffeurs.....	691	13.20	22.68	442,512.00	.96	4,248.12
9010 Asylums, Hospitals, Employees, and chauffeurs' helpers.....	181	19.38	39.60	118,149.00	.55	623.97
9050 Hotel Employees (excluding laundry).....	705	10.38	29.86	547,397.00	.55	3,031.97
9055 Athletic Clubs.....	19	35.00	50.00	23,095.00	.55	133.90
9066 Country Clubs.....	26	16.20	45.00	24,760.00	.55	133.90
9070 Lunch Rooms.....	14	11.46	24.00	8,895.00	.47	41.81
9071 Restaurants.....	548	14.34	48.60	517,012.00	.47	2,429.96
9072 Club Houses (not athletic, country or yacht).....	116	13.56	42.60	94,350.00	.55	522.23

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1919, to June 30, 1920—Table II—(Continued)

		Average No. Employees	Average Weekly Wage Minimum	Average Weekly Wage Maximum	Payroll	Rate	Premium
9078	Commissary Work (employees engaged in connection with manufacturing, lumbering or contract risks, not exposed to mechanical hazard)	164	10.32	28.50	115,290.00	1.18	1,360.42
9084	Billiards and Bowling Halls	27	13.00	33.00	26,763.00	.80	214.10
9101	College and School Buildings (care and maintenance of)	366	12.48	31.38	290,313.00	.98	2,403.00
9102	Parks or Buildings Used for Exhibitions N. O. C.	30	7.00	35.00	1,535.00	.98	168.33
9150	Theater Employees with Stage Duties or Care of Premises	65	19.73	44.58	1,081.00	.96	710.99
9152	Theater Companies (motion picture theaters)	284	16.62	54.00	302,143.00	.34	1,027.29
9154	Theater Employees (including managers, not stage managers, box office employees, ushers and others not employed upon the stage)	47	11.70	96.00	61,230.00	.17	104.09
9180	Exhibitions (care of amusement devices) N. O. C.	2	14.00	35.00	1,185.00	7.00	82.95
9181	Baseball Clubs and Parks (all players, including umpires)	24	60.00	120.00	25,549.00	2.78	710.26
9183	Bath Houses and Bathing Pavilions (beach)	114	9.18	45.00	56,713.00	1.34	759.95
9220	Cemetery Employees	18	16.14	16.14	18,000.00	1.61	289.80
9403	Street Cleaning (including drivers, etc.)	180	25.00	30.00	220,061.00	3.85	8,472.35
9410	Marriage Celebrants (including drivers and chauffeurs)	58	30.12	56.40	53,988.00	3.85	2,077.77
9511	Municipal Employees (County and State Employees N. O. C.)	402	19.40	72.00	342,090.00	.55	1,881.50
9516	Municipal Employees (shop only)	23	31.08	37.08	30,901.00	.80	247.21
9505	Painting (automobile and carriage bodies only)	15	18.00	48.00	23,018.00	.80	184.14
9520	Upholstering (away from shop)	4	25.02	31.50	4,152.00	.55	222.84
9522	Upholstering	16	12.00	30.00	22,366.00	.61	186.43
9525	Coffin and Casket Manufacturing (upholstery work and manufacture of burial garments)	4	14.40	43.00	5,005.00	.25	12.52

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH
July 1, 1919, to June 30, 1920—Table II—(Continued)

	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Payroll	Rate	Premium
9541 Sign, Painting or Lettering on Buildings or Structures.....	14	12.00	52.80	21,315.00	8.68	784.39
9543 Awning and Tent Erection.....	7	25.00	30.00	91,800.00	3.68	66.24
9580 Barber Shop.....	78	35.00	18.20	93,240.00	.42	391.80
9583 Hairdressing for Women.....	7	12.00	18.00	10,050.00	3.11	111.80
9590 Blacksmithing—Shoeing.....	10	30.00	41.40	11,515.00	2.10	282.82
9600 Taxidermists.....	1	30.00	30.00	2,050.00	1.13	23.17
9610 Motion Pictures (production of and all operations up to the develop- ment of negatives).....	9	38.96	72.00	13,121.00	1.94	254.55
9620 Undertakers.....	15	28.32	63.32	28,102.00	1.13	317.55
9630 Ice Harvesting and Storing Only (including drivers and drivers' helpers and chauffeurs).....	82	21.00	49.50	14,275.00	6.37	909.32
Grand Total.....	63,179			\$75,034,219.00		\$1,911,392.41

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV.

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for—Amount	Paid to S. I. F.—Amount	Remarks
1001	July 11, 1919			1					\$ 150.00		\$ 2,250.00		Settlement pending
1001	July 18, 1919	1	1	1					150.00	4,992.00			Settlement pending
1001	July 31, 1919	1	1						150.00	4,992.00			Settlement pending Settled by compromise with company
1001	Aug. 11, 1919			2					150.00				Settlement pending
1001	Aug. 15, 1919			1					144.00	750.00			Settlement pending
1001	Aug. 16, 1919								160.00	4,992.00			Settlement pending
1001	Sept. 12, 1919	1	5				1		183.00		3,650.00		Costs, \$204.75. Dependents in Greece
1001	Sept. 18, 1919			2					150.00				Settlement pending
1001	Oct. 13, 1919	1	3										Settlement pending
1001	Oct. 20, 1919								150.00				Settlement pending
1001	Oct. 21, 1919	1	1						150.00	1,850.00			Settlement pending
1001	Nov. 26, 1919	1	4						150.00	4,992.00			Settlement pending
1001	Nov. 26, 1919	1	5						150.00	4,992.00			Settlement pending
1001	Dec. 2, 1919				1				485.00				Settlement pending
1001	Dec. 5, 1919					1			485.00				Settlement pending
1001	Dec. 6, 1919								150.00				Settlement pending
1001	Jan. 7, 1920	1	1						150.00	5,000.00			Settlement pending
1001	Jan. 7, 1920				1				234.00				Settlement pending
1001	Jan. 9, 1920						1						Settlement pending
1001	Jan. 13, 1920								150.00	1,800.00	2,500.00		Costs, \$600.00. Mother in Greece
1001	Jan. 30, 1920			1					150.00				Settlement pending

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for—Amount	Paid to S. I. F.—Amount	Remarks
1001	Feb. 6, 1920				1				150.00	1,800.00	2,500.00		Settlement pending
1001	Feb. 7, 1920								150.00				Settlement pending
1001	Feb. 9, 1920				1				150.00	4,992.00			Settlement pending
1001	Feb. 15, 1920			1					150.00	2,250			Settlement pending
1001	Feb. 19, 1920		4						150.00				Settlement pending
1001	Feb. 26, 1920	1		2	1				150.00				Settlement pending
1001	May 28, 1920			1		1			150.00				Settlement pending
1001	May 31, 1920		1						150.00				Settlement pending
1001	June 14, 1920	1				1			150.00				Settlement pending
1001	June 15, 1920												
	Totals	9	25	14	5	3	3		4,468.15	41,192.00	13,150.00		
1140	Aug. 30, 1919												
1140	Sept. 12, 1919						1		150.00		1,800.00		Settlement pending
1140	Sept. 15, 1919			2					150.00				Settlement pending
1140	Oct. 13, 1919					1			150.00				Settlement pending
1140	Oct. 23, 1919			1						4,000.00			Settlement pending
1140	Nov. 3, 1919	1	1						150.00				Settlement pending
1140	Dec. 11, 1919												
1140	Jan. 6, 1920				1				150.00				Settlement pending
1140	Jan. 6, 1920			1					150.00	2,400.00			Settlement pending
1140	Feb. 1, 1920	1	1						150.00	4,992.00	2,150.00		Settlement pending
1140	Feb. 1, 1920			2					219.00				Settlement pending
1140	Feb. 23, 1920												Settlement pending
													Costs, \$719.17

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for—Amount	Paid to S. I. F.—Amount	Remarks
1140	March 2, 1920	1	1						150.00		3,800.00		
1140	March 2, 1920	1	4				1		153.00	4,992.00			
1140	March 6, 1920	1	1						150.00	1,440.00			
1140	March 6, 1920	1	1	1					150.00	4,992.00			
1140	March 13, 1920	1	1				1		150.00				
1140	March 18, 1920	1	1						150.00	4,992.00			
1140	March 28, 1920	1	1						150.00	2,500.00			
1140	March 31, 1920	1							150.00				
1140	April 5, 1920						1		150.00	2,160.00			
1140	April 18, 1920			1	2				150.00				
1140	April 27, 1920			2			1		200.00				
1140	May 10, 1920			1					150.00				
1140	May 27, 1920	1	6						150.00	4,492.00	2,250.00		Settlement pending
1140	June 17, 1920								150.00				
	Total	8	16	11	3	1	2		3,122.00	37,460.00	10,000.00		
1430	July 27, 1919								150.00	1,500.00			
1430	Aug. 8, 1919	1	5	1					150.00	4,602.00			
1430	Oct. 10, 1919					1			150.00				
	Total	1	5	1		1			450.00	6,102.00			
1452	Aug. 12, 1919	1	1								4,200.00		

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for Amount	Paid to S. I. F.—Amount	Remarks
1001	Feb. 6, 1920								150.00				Settlement pending
1001	Feb. 7, 1920			2	1				150.00	1,800.00	2,500.00		Settlement pending
1001	Feb. 9, 1920				1				150.00	4,992.00			Settlement pending
1001	Feb. 15, 1920		4						150.00	2,250			Settlement pending
1001	Feb. 19, 1920	1							150.00				Settlement pending
1001	Feb. 26, 1920			2	1				150.00				Settlement pending
1001	May 28, 1920			1		1			150.00				Settlement pending
1001	May 31, 1920		1						150.00				Settlement pending
1001	June 14, 1920	1	1			1			150.00				Settlement pending
1001	June 15, 1920								150.00				Settlement pending
	Totals	9	25	14	5	3	3		4,468.15	41,192.00	13,150.00		
1140	Aug. 30, 1919								150.00				Settlement pending
1140	Sept. 12, 1919						1		150.00				Settlement pending
1140	Sept. 19, 1919			2		1			150.00	1,800.00			Settlement pending
1140	Oct. 13, 1919						1		150.00				Settlement pending
1140	Oct. 23, 1919			1					150.00				Settlement pending
1140	Nov. 3, 1919		1						150.00	4,000.00			Settlement pending
1140	Dec. 11, 1919	1	1		1				150.00				Settlement pending
1140	Jan. 6, 1920			1					150.00	2,400.00	2,150.00		Settlement pending
1140	Jan. 6, 1920			1					150.00	4,992.00			Settlement pending
1140	Jan. 11, 1920	1	1						150.00				Settlement pending
1140	Feb. 23, 1920			2			1		219.00				Settlement pending
	Totals	1	1	2			1		150.00	2,400.00	2,150.00		Settlement pending
									150.00	4,992.00			Settlement pending
									219.00				Settlement pending

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for Amount	Paid to S. I. F.—Amount	Remarks
1140	March 2, 1920								150.00				
1140	March 2, 1920	1	1				1			4,992.00	2,000.00		
1140	March 6, 1920	1	4						150.00	4,992.00			
1140	March 6, 1920	1	1						150.00	4,992.00			
1140	March 13, 1920	1	1				1		150.00	4,992.00			
1140	March 19, 1920	1	1						150.00	4,992.00			
1140	March 28, 1920	1	1						150.00	4,992.00			
1140	March 31, 1920	1					1		150.00	2,500.00			
1140	April 5, 1920								150.00	2,160.00			
1140	April 8, 1920								150.00				
1140	April 27, 1920								250.00				
1140	May 10, 1920								150.00				
1140	May 27, 1920	1	6						150.00	4,992.00	2,250.00		Settlement pending
1140	June 17, 1920												
Total		8	16	11	3	1	7		3,122.00	37,460.00	10,000.00		
1430	July 27, 1919								150.00	1,500.00			
1430	Aug. 8, 1919								150.00	1,500.00			
1430	Oct. 10, 1919	1	5						150.00	4,602.00			
Total		1	5	1			1		450.00	6,102.00			
1452	Aug. 12, 1919	1	1								4,500.00		

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-industrial	Burial, Medical and Transportation Amount	Settled Under Compensation Act, Amount	Settled in Court for—Amount	Paid to S. I. F.—Amount	Remarks
1622	Jan. 15, 1920	1							150.00	4,992.00			
1701	Aug. 5, 1919	1	1						150.00	3,781.00			
2030	Oct. 14, 1919	1	2						150.00	4,992.00			
2030	Oct. 28, 1919	1							150.00	4,779.84			
	Total	2	2						300.00	9,771.84			
2090	July 24, 1919								150.00	1,650.00			
2090	Aug. 11, 1919	1	1						230.00	4,992.00			
	Total	1	1						380.00	6,642.00			
2111	Aug. 31, 1919									2,000.00			
2581	April 20, 1920	1							289.00	4,485.65			
3000	May 25, 1920								150.00				
4524	Feb. 26, 1920			2						3,864.75			Settlement pending
4534	Feb. 26, 1920	1	1						150.00	4,992.00			

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY

July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
4740	Feb. 3, 1920	1						1	150.00				
5084	Feb. 6, 1920							1					
5204	Aug. 30, 1920								157.00	2,192.00			
5401	June 13, 1920												
5480	April 9, 1920	1							267.95	4,992.00			
6012	Aug. 8, 1919	1							160.00	4,321.00			
6042	Sept. 4, 1919	1							93.14	2,000.00			
	Total	2	2						253.14	6,321.00			
6104	Nov. 7, 1919	1							155.00	3,104.00			
6104	Nov. 7, 1919	1							155.00	4,992.00			
	Total	1							310.00	8,096.00			
7102	May 5, 1920								110.00				
7102	May 5, 1920								150.00				
	Total								260.00				

Re-hearing denied

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
7128	Nov. 15, 1919	1	2								1,000.00		
7380	Sept. 5, 1919		2								200.00		Third party, \$200.00
7531	July 16, 1919								135.00	3,490.20			
7531	Nov. 5, 1919		4						150.00	4,992.00			
7531	Jan. 23, 1920	1	1	2					150.00	4,992.00			
7531	May 27, 1920	1	1						150.00	4,433.52			
	Total	2	2	2					585.00	17,907.72			
7600	Aug. 15, 1919						1					750.00	
8003	July 11, 1919	1	1						150.00	4,927.93			
8010	Dec. 30, 1919			2					170.00	3,199.00			
8203	July 13, 1919			2					150.00	3,584.88			
8207	June 5, 1920				1				150.00	1,800.00			
9007	March 10, 1920	1	4						150.00	3,547.44			
9050	Dec. 17, 1919				1				383.50				Court settlement

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1919, to June 30, 1920—Table IV

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
9078	April 5, 1920								150.00				Settlement pending Settlement pending
9078	April 5, 1920								150.00				
	Total								300.00				
9402	Sept. 4, 1919	1							150.00	4,592.00	2,500.00		Third party, \$2,500
9402	Nov. 23, 1919	1	3						150.00	3,088.80			
9402	May 26, 1920	1	1						150.00				
	Total	3	3						450.00	8,080.80	2,500.00		
	Grand total	40	80	43	10	1	12	2	\$ 13,506.74	\$189,982.01	\$ 31,050.00	\$750.00	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V

Class	No.	Med.	Time Lost, Due to Total Dis., Days	Compensation Paid for Total Dis.	Specific Award for Dismemberment, Loss of Use or Function:	Weeks	Amount
TOTAL DISABILITIES: For this period of time, none.							
PARTIAL DISABILITIES:							
1452	1	Exclusion	262	\$ 598.86	\$	90	1,391.50
2040	1	Loss of arm, 50 per cent function of at elbow	180.30	126.36		100	1,056.00
4622	1	Loss of arm, 15 per cent use, right	114	260.57		30	480.00
4623	1	Loss of arm, 15 per cent use, left	21	38.49		100	2,052.80
1534	1	Loss of arm, between wrist and elbow	152.00	182.40		30	480.00
1001	1	Loss of arm, between wrist and elbow (five toes and metatarsal bones)	500.00	800.00		235	3,508.00
1640	1	Loss of arm, right	571.45	687.71		200	2,761.35
2040	1	Loss of elbow, impairment of motion	17.00	388.00		19	304.00
1701	1	Loss of wrist, stiff	24	251.43		10	160.00
2293	1	Loss of thumb	437.89	336.00		30	462.93
2731	1	Loss of thumb, end of (ninth metacarpal bone)	84.50	141.71		35	560.00
2731	1	Loss of thumb, end of (tenth metacarpal bone)	114.00	160.00		4	112.16
2731	1	Loss of thumb, end of	19.00	70.10		4	112.16
2731	1	Loss of thumb, action of	52.00	237.71		30	480.00
8207	1	Loss of thumb, distal phalanx	60.00			5 1/2	86.86
1110	1	Loss of thumb, distal phalanx	Exclusion	64.00		20	320.00
1110	1	Loss of thumb, distal and one-fourth proximal phalanx	216.50	196.57		22 1/2	350.02

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Due to Total	Compensation Paid For Total Dis.	Specific Award for Dismemberment, Loss of Use or Function	Weeks	Amount
1001	Loss of thumb, one-half distal phalanx	1	Exclusion	11	25.14		10	160.00
2041	Loss of thumb, one-third distal phalanx	1	29.00	30	33.38		7	51.53
4334	Loss of thumb, distal phalanx (index, distal phalanx)	1	36.00	34	56.63		37 ¹ / ₂	519.37
2041	Loss of thumb, distal phalanx (index, distal phalanx)	1	Exclusion	21	48.00		30	490.00
4300	Loss of thumb, distal phalanx (ring, part distal phalanx; little, distal and middle phalanx)	1	323.00	163	188.34		23	185.61
2731	Loss of finger, index	1	49.50	58	103.24		12	149.52
2731	Loss of finger, index	1	60.00	22	50.28		10	160.00
2010	Loss of finger, index (10 per cent use of thumb)	1	Exclusion	22	50.29		20	320.00
4325	Loss of finger, index, distal phalanx	1	271.00	175	394.75		20	315.80
4325	Loss of finger, index, distal phalanx	1	Exclusion	121	348.14		35	580.19
1140	Loss of finger, index, distal phalanx	1	60.00	21	60.00		10	160.00
1000	Loss of finger, index, distal phalanx	1	50.00	42	96.00		10	160.00
2660	Loss of finger, index, distal and middle phalanx	1	19.00	34	61.71		10	160.00
1140	Loss of finger, index, distal and middle phalanx	1	Exclusion	45	95.05		15	240.00
2090	Loss of finger, index, distal and middle phalanx	1	66.00	20	45.71		15	240.00
4332	Loss of finger, distal and middle phalanx	1	117.75	41	124.00		12 ¹ / ₂	200.00
4332	Loss of finger, distal and middle phalanx	1	Exclusion	31	92.59		5	80.00
3063	Loss of finger, index, one-half distal phalanx	1	37.00	23	52.57		5	51.90
3065	Loss of finger, index, one-half distal phalanx	1	29.00				5	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Due to Total Dis., Days	Compensation Paid for Total Dis.	Specific Award for Dismemberment, Loss of Use or Function:	Weeks	Amount
5401	Loss of finger, index and middle, distal and middle phalanx	1	126.50	75	164.57	22½	397.15	
2731	Loss of finger, index and middle, distal phalanx.	1	48.00	45	102.86	15	240.00	
5204	Loss of finger, index and middle, distal, middle and one-half proximal phalanx	1						
2030	Loss of finger, index, distal and middle phalans; middle	1	42.00	56	128.00	30	480.00	
1432	Loss of finger, index, and middle, distal phalanx	1	81.00	53	123.43	20	320.00	
1001	Loss of finger, index, one-half distal phalanx; middle, distal and one-half middle phalanx	1	65.00	81	176.00	15	240.00	
3066	Loss of finger, index, distal phalanx; middle distal and middle phalanx	1	155.00	42	96.00	18	285.01	
3811	Loss of finger, index, middle, ring and little (metacarpal bones)	1	89.00	99	195.88	20	277.00	
8224	Loss of finger, index, seven-cuptha distal phalanx; middle and ring, distal and middle phalanx	1	78.75	77	176.00	92	1,421.35	
7531	Loss of finger, index and ring, distal phalanx	1	25.00	63	144.00	25	400.00	
9101	Loss of finger, index, middle, ring and little, fourth proximal phalanx; middle, distal and middle phalanx; ring, distal and one-half middle phalanx	1	Exclusion	14	30.61	14	214.48	
1001	Loss of finger, index, distal and middle phalans; middle, ring and little	1	19.00	42	89.52	32½	481.17	
1140	Loss of finger, middle (metacarpal bone)	1	283.00	78	160.00	51	816.00	
8224	Loss of finger, middle, distal phalanx	1	Exclusion	115	256.00	30	474.36	
3220	Loss of finger, middle, distal phalanx	1	50.00	71	107.73	7	84.84	
2011	Loss of finger, middle, distal phalanx	1	26.00	22	50.29	5	80.00	
1001	Loss of finger, middle, distal phalanx	1	31.00	22	61.78	6½	80.00	
		1	Exclusion	27	61.78	6½	100.67	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V—(Continued)

Cases	PARTIAL DISABILITIES	No.	Med.	Time Lost, Days, Due to Total	Compensation Paid for Total Dis.	Specific Award for Permanent Loss of Use or Function:	Weeks	Amount
1140	Loss of finger, middle, distal phalanx	1	Exclusion	24	54.86		5	80.00
4000	Loss of finger, middle, distal phalanx	1	25.00	42	96.00		5	80.00
1001	Loss of finger, middle, distal phalanx	1	Exclusion	42	94.50		4	63.00
7134	Loss of finger, middle, one-half distal phalanx	1	44.00	32	62.50		4	17.50
7134	Loss of finger, middle, one-half distal phalanx	1	Exclusion	30	62.50		2 1/2	37.50
9071	Loss of finger, middle, four-fifths distal phalanx	1	Exclusion	24	53.66		4	64.00
3632	Loss of finger, middle, end of	1	17.00	25	25.00		1 1/2	12.00
8003	Loss of finger, middle, distal and one-half middle phalanx	1	15.00	15	34.29		8	128.00
1001	Loss of finger, middle, distal and middle phalanx; ring, distal phalanx	1	Exclusion	33	76.43		14	224.00
1140	Loss of finger, middle, distal and one-half middle phalanx; ring, distal phalanx; index, tip	1	66.50	95	217.14		11	176.00
3210	Loss of finger, middle, and ring, distal phalanx	1	35.00	16	76.69		9	98.42
1452	Loss of finger, middle, ring and little	1	94.00	116	229.68		36	547.72
5500	Loss of finger, middle and ring	1	108.50	91	208.00		17	272.00
1622	Loss of finger, ring, 25 per cent use of	1	76.00	42	96.00		28	448.00
8003	Loss of finger, ring, distal phalanx	1	Exclusion	95	217.14		37 1/2	600.00
5211	Loss of finger, ring, distal phalanx	1	33.00	14	31.50		4	63.00
5211	Loss of finger, ring, distal phalanx	1	107.00	36	311.25		4	63.00
1001	Loss of finger, ring, distal phalanx	1	Exclusion	37	84.57		4	64.00
8260	Loss of finger, ring, distal phalanx	1	15.00	2	4.35		4	60.92

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Days Due to Total	Compensation Paid for Total Dis.	Specific Award for Dismemberment, Loss of Use or Function:	Weeks	Amount
5401	Loss of finger, index and middle, distal and middle phalanx	1	126.50	75	164.57		22 ¹ / ₂	397.15
5401	Loss of finger, index and middle, distal phalanx	1	48.00	45	102.86		15	240.00
5294	Loss of finger, index and middle, distal, middle and one-half proximal phalanx	1	42.00	56	128.00		30	480.00
2030	Loss of finger, index, distal and middle phalanx; middle	1	81.00	53	123.43		20	320.00
1452	Loss of finger, index, and middle, distal phalanx	1	65.00	81	176.00		15	240.00
1001	Loss of finger, index, one-half distal phalanx; middle, distal and one-half middle phalanx	1	155.00	42	96.00		18	285.91
3056	Loss of finger, index, distal phalanx; middle distal and middle phalanx	1	78.00	79	155.88		20	277.00
3211	Loss of finger, index, distal phalanx; middle distal and middle phalanx	1	78.75	77	176.00		32	1,421.35
4224	Loss of finger, index, seven-eighths distal phalanx; middle and ring, distal and middle phalanx	1	25.00	63	144.00		25	400.00
7531	Loss of finger, index and ring, distal phalanx	1	Exclusion	14	30.64		14	214.48
9101	Loss of finger, index, distal, middle and one-fourth proximal phalanx; middle, distal and middle phalanx; ring, distal and one-half middle phalanx	1	19.00	42	89.52		32 ¹ / ₂	491.17
1001	Loss of finger, index, distal and middle phalanx; middle, ring and little phalanx	1	325.00	113	250.00		31	816.00
1140	Loss of finger, index, distal and middle phalanx; middle, ring and little phalanx	1	Exclusion	113	250.00		31	816.00
8224	Loss of finger, middle, distal phalanx	1	50.00	71	107.73		7	80.00
3220	Loss of finger, middle, distal phalanx	1	26.00	22	50.29		5	80.00
2041	Loss of finger, middle, distal phalanx	1	51.00	22	50.29		5	80.00
1001	Loss of finger, middle, distal phalanx	1	Exclusion	27	61.78		6 ¹ / ₂	106.67

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Due to Total	Compensation Paid for Total Dis.	Specific Award for Dismemberment, Loss of Use or Function:	Weeks	Amount
1140	Loss of finger, middle, distal phalanx	1	Exclusion	24	54.86		5	80.00
4000	Loss of finger, middle, distal phalanx	1	25.00	42	96.00		5	80.00
1001	Loss of finger, middle, one-half distal phalanx	1	Exclusion	42	94.50		4	63.00
7128	Loss of finger, middle, one-half distal phalanx	1	44.00	32	2.00		2 ¹ / ₂	19.50
9071	Loss of finger, middle, four-fifths distal phalanx	1	Exclusion	30	65.26		2 ¹ / ₂	47.40
3632	Loss of finger, middle, end of	1	Exclusion	24	55.00		2	40.00
8003	Loss of finger, middle, distal and one-half middle phalanx	1	17.00	25	25.00		1 ¹ / ₂	12.00
1001	Loss of finger, middle, distal and middle phalanx; ring, distal phalanx	1	15.00	15	34.29		8	128.00
1140	Loss of finger, middle, distal and one-half middle phalanx; ring, distal phalanx	1	Exclusion	33	75.43		14	224.00
3210	Loss of finger, middle, ring, distal phalanx	1	66.50	95	217.14		11	176.00
1452	Loss of finger, middle, ring and little	1	95.00	86	258.57		10	584.00
5500	Loss of finger, middle, ring and little	1	94.00	116	259.64		36	592.00
1622	Loss of finger, ring, loss use of	1	108.50	91	208.00		17	272.00
1140	Loss of finger, ring, 25 per cent use of	1	76.00	42	96.00		28	448.00
8003	Loss of finger, ring, distal phalanx	1	Exclusion	95	217.14		37 ¹ / ₂	600.00
5209	Loss of finger, ring, distal phalanx	1	33.00	14	31.70		4	63.40
1001	Loss of finger, ring, distal phalanx	1	23.00	36	81.87		4	63.68
8269	Loss of finger, ring, distal phalanx	1	102.50	35	84.57		4	64.00
		1	Excl.	35	84.57		4	64.00
		1	15.00	2	4.35		4	60.92

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING
July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Days, Due to Total	Compensation Paid for Total Dis.	Weeks	Amount	Specific Award for Dismemberment, Loss of Use or Function:
8028	Loss of finger, ring, distal and phalanx	1	137.75	71	155.45	8	128.00	
1140	Loss of finger, ring, distal and middle phalanx	1	85.00	68	102.56	8	128.00	
1140	Loss of finger, ring, distal and one-half middle phalanx	1	Exclusion	68	102.56	8	128.00	
2803	Loss of finger, ring, distal and one-half middle phalanx	1	10.00	13	29.71	5	80.00	
1140	Loss of finger, ring, distal and one-half middle phalanx	1	Exclusion	44	101.33	6	96.00	
1140	Loss of finger, ring, distal, middle and one-third proximal phalanx	1	25.00	45	102.86	12	196.00	
1001	Loss of finger, ring and little, distal and middle phalanx	1	24.00	14	32.00	14	224.00	
3066	Loss of finger, ring and little, distal and middle phalanx	1	50.00	135	215.36	9	101.25	
5002	Loss of finger, ring and little, distal and middle phalanx	1	47.42	184	432.00	76	1,184.00	
1140	Loss of finger, ring and little, use of index and middle (thumb, distal phalanx)	1	Exclusion	84	192.00	3	48.00	
1330	Loss of finger, little, distal phalanx	1	15.00		54.72	3	48.00	
3724	Loss of finger, little, distal and middle phalanx	1	Exclusion	24	54.72	6	91.92	
1141	Loss of finger, little, distal and middle phalanx	1	31.00			14	224.00	
8862	Loss of finger, little, distal and one-half middle phalanx	1	30.00	50	111.29	4 1/2	70.11	
8210	Loss of finger, little, distal and one-half middle phalanx	1	30.00	50	111.29	4 1/2	70.11	
3631	Loss of finger, little, distal, middle and one-half proximal phalanx	1	103.00	91	208.00	14 1/2	220.00	
1640	Loss of leg, between knee and ankle	1	285.20	210	383.60	140	1,624.79	
1001	Loss of leg, between knee and ankle	1	Exclusion	105	278.86	140	2,240.00	
1140	Loss of leg, between knee and ankle	1	Exclusion	171	390.86	140	2,137.24	
2030	Loss of leg, below knee	1	218.00	141	299.43	140	2,240.00	
1140	Loss of leg, at knee	1	969.16	297	678.86	150	2,268.05	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING
July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost, Days, Due to Total	(Compensation Paid for Total Dis.	Specific Award for Membership, Loss of Use or Function:	Weeks	Amount
1140	Loss of leg, above knee	1	Exclusion	213	450.00		150	2,400.00
7127	Loss of toe, great	1	Exclusion	156	422.30		15	215.30
5602	Loss of toe, great	1	106.50	76	170.56		15	235.65
6104	Loss of toe, great, distal and one-half middle phalanx	1	151.00	133	304.00		12 ^{1/2}	200.00
1140	Loss of toe, great and first	1	413.00	140	320.00		42	672.00
1140	Loss of toe, great and first	1	52.00	70	133.20		21	321.72
1140	Loss of toe, fourth	1	15.00	15	11.43		6	96.00
5602	Loss of toe, fourth	1	87.00	61	139.43		100	1,542.67
5401	Loss of eye, sight, one	1	49.00	49	112.00		100	1,561.51
1140	Loss of eye, sight, one	1	355.55	98	215.48		100	1,482.45
2030	Loss of eye, sight, one	1	286.33	69	153.86		100	1,600.00
1601	Loss of eye, sight, one	1	Exclusion	14	32.00		100	1,672.04
1001	Loss of eye, sight, one	1	Exclusion	100	240.00		100	1,865.20
6104	Loss of eye, sight, one	1	130.00	30	60.00		100	1,600.00
1141	Loss of eye, sight, one	1	Exclusion	41	116.57		100	1,600.00
9650	Loss of eye, sight, one	1	257.00	70	70.70		100	1,010.00
1140	Loss of eye, 20 per cent sight, one	1	121.00	30	64.57		20	320.00
1622	Loss of eye, 25 per cent sight, one	1	36.00	39	89.14		25	400.00
1152	Loss of eye, enucleation	1	Exclusion	92	210.29		120	1,854.37
1152	Loss of eye, enucleation	1	Exclusion	106	227.52		120	1,704.90

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING
July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	No.	Med.	Time Lost, Due to Total Dis., Days	Compensation Paid for Total Dis.	Weeks	Amount
PARTIAL DISABILITIES						
1425	1	Exclusion	107	244.57	120	1,834.74
7127	1	100.00	30	50.57	120	1,399.54
2121	1	185.45	16	36.57	120	1,920.00
3382	1	328.00	35	112.00	120	1,920.00
2023	1	97.00	11	25.14	120	1,920.00
6012	1	50.00	24	54.86	120	1,920.00
1140	1	217.50	31	70.86	120	1,920.00
1140	1	Exclusion	74	150.02	8	113.36
1001	1	246.00	20	320.00	Award	650.00
PARTIAL DISABILITIES SUMMARY						
1000	1	Exclusion	20	45.71	10	160.00
1001	15	1,494.33	988	2,559.29	732	12,356.78
1140	22	2,141.86	1,866	4,214.40	956	15,007.26
1430	1	Exclusion	84	192.00	3	48.00
1441	2	Exclusion	65	171.29	106	1,691.92
1452	5	135.00	489	1,091.31	203	3,183.37
1622	2	856.65	489	1,091.31	240	4,356.14
1701	1	Exclusion	110	251.43	10	160.00
2080	6	1,124.85	575	1,547.45	399	5,718.25
2041	3	124.00	64	85.87	14 1/2	154.93
2063	1	437.89	147	336.00	30	463.93

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING
July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	No.	Med.	Time Lost, Due to Total Dis., Days	Dismemberment, for Total Dis.	Specific Award for Dismemberment, Loss of Use or Function:	
					Weeks	Amount
3000	1	66.00	30	45.71	15	340.00
3121	1	185.45	16	38.57	12	1,160.00
3660	1	19.00	34	61.71	110	1,600.00
3731	7	359.00	384	841.51	139	2,181.52
3803	1	10.00	13	29.71	6	86.00
3804	1	10.00	35	70.10	8	112.16
3865	1	139.00	234	411.24	5	51.90
3870	2	139.00	18	26.59	29	388.25
3870	1	35.00	18	26.59	9	66.00
3870	1	100.00	91	208.00	140	2,240.00
3870	1	26.00	16	36.57	5	80.00
3870	1	18.00	16	36.57	6 1/2	102.86
3870	1	17.00	25	25.00	1 1/2	12.00
3870	1	15.00	113	87.85	3	48.00
3870	2	15.00	42	96.00	5	1,486.03
4000	1	25.00	163	188.34	23	185.61
4300	1	34.00	21	38.49	160	2,052.80
4524	2	188.00	125	238.89	197 1/2	2,762.57
4534	1	42.00	56	128.00	30	480.00
5204	1	102.00	15	34.29	4	61.00
5208	1	111.00	15	111.00	4	61.00
5400	4	309.92	324	848.00	235 1/2	3,349.33
5500	1	108.50	91	208.00	17	272.00

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING
July 1, 1919, to June 30, 1920—Table V—(Continued)

Class	PARTIAL DISABILITIES					No.	Med.	Time Lost, Due to Total Dis., Days	Compensation Paid for Total Dis.	Weeks	Amount
5-02						1	87.25	84	192.00	76	1,181.20
5-02						1	121.50	81	181.99	21	331.65
6-02						2	50.00	24	54.86	120	1,920.00
6-04						2	281.00	168	384.00	112 1/2	1,800.00
7-02						1	38.00	21	48.00	4	64.00
7-12						1	100.00	186	472.87	135	1,525.84
7-12						1	Exclusion	30	65.26	2 1/2	37.40
7-12						1	Exclusion	14	30.64	14	214.48
8-03						3	85.00	22	118.56	17	271.40
8-03						1	125.00	11	154.12	10	231.00
8-03						1	57.00	11	25.14	120	1,920.00
8-03						1	50.00	5 1/2	86.86	5 1/2	86.86
8-23						1	117.75	71	162.29	15	240.00
8-23						2	75.00	134	251.73	32	484.84
8-26						1	15.00	2	4.35	4	60.92
8-32						1	328.00	35	112.00	120	1,920.00
9-00						1	31.00	70	153.20	21	321.72
9-00						1	257.00	70	70.70	100	1,010.00
9-01						1	Exclusion	24	34.86	4	64.00
9-01						1	19.00	42	89.52	32 1/2	481.17
Grand total						126	\$ 10,973.00	8485	\$ 19,106.38	5420 1/2	\$ 82,935.58

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees.	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
4 Florists	41	\$12.50	\$40.00	\$ 90,018.00	\$.48	\$ 432.08
250 Irrigation works and operation	186	25.00	50.00	65,115.00	2.80	1,222.06
1001 Coal Mining	3,456	25.00	45.00	5,895,115.00	2.80	1,222.06
1002 Metal mining	4,210	25.00	45.00	5,732,510.00	4.41	254,523.44
1200 Shale and clay mining	36	18.50	51.00	44,408.00	3.70	1,643.10
1410 Assaying	37	26.40	37.40	47,596.00	1.68	901.63
1430 Lead smelting	1,398	19.85	64.80	2,702,633.00	3.87	94,591.90
1441 Copper smelting	1,354	16.00	60.30	1,937,632.00	2.33	42,818.83
1452 Concentration and amalgamation	1,737	26.70	68.25	2,731,172.00	4.04	111,147.35
1470 Coke manufacturing	147	18.40	36.95	158,497.00	5.09	7,511.00
1482 Quarrying	164	19.25	56.50	58,392.00	3.07	1,292.63
1500 Cement manufacturing	192	15.15	71.85	289,783.00	2.55	7,389.45
1701 Plaster manufacturing (no quarrying)	24	18.75	34.00	27,813.00	2.55	699.23
1744 Talc, mills (no quarrying)	2	30.00	42.00	2,415.00	1.68	39.77
1801 Marble cutting and polishing	23	12.50	141.75	30,580.00	1.93	590.20
1803 Stone dressing (hand work)	18	12.50	37.15	24,532.00	1.93	402.07
2000 Bakeries	803	18.32	37.00	27,732.00	1.38	352.60
2001 Flour mills	5	7.10	35.00	4,000.00	1.48	59.20
2011 Millers N. O. C.	114	21.90	47.50	110,997.00	1.93	2,221.24
2014 Millers N. O. C.	18	19.90	39.40	18,442.00	1.93	355.95
2010 Beet sugar manufacturing	1,619	20.70	90.65	1,519,159.00	2.23	33,877.25
2040 Ice cream manufacturing	48	11.10	30.00	33,383.00	2.13	711.06

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919.—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
2041 Candy manufacturing	744	8.80	50.35	442,314.00	.73	3,228.90
2049 Coffee roasting and grinding	9	18.00	26.35	8,587.00	.98	84.16
2052 Condensed milk manufacturing	206	10.00	30.75	168,071.00	1.13	1,892.20
2053 Creameries and dairies	163	13.95	32.10	130,755.00	1.13	1,477.53
2054 Slaughtering of live stock (including handling)	368	13.40	38.60	107,072.00	3.10	3,961.67
2055 Packing houses	346	17.00	31.00	398,656.00	1.46	3,265.67
2092 Sausage manufacturing	43	25.00	31.05	36,856.00	1.46	311.57
2102 Fruit evaporating	27	10.00	20.23	17,472.00	.98	171.23
2105 Fruit packing (no box manufacturing)	9	8.50	28.60	12,282.00	.73	86.66
2110 Pickle manufacturing	47	11.75	32.65	21,538.00	1.28	276.69
2111 Canneries	756	11.85	42.20	385,293.00	1.28	4,931.75
2112 Fruit preserving	51	6.00	25.00	4,560.00	.73	33.29
2113 Fruit and vegetable canning	51	24.00	31.00	65,865.00	2.03	1,276.24
2140 Vinegar manufacturing	2	24.00	24.00	800.00	1.48	18.24
2141 Cider manufacturing	2	24.00	28.00	550.00	1.48	8.14
2150 Ice manufacturing	75	20.55	40.20	78,849.00	2.80	2,213.28
2161 Bottling under pressure	16	15.85	39.00	8,450.00	3.37	283.13
2171 Cigar and cigarette manufacturing	26	9.65	29.35	29,590.00	.33	97.65
2181 Wood pulping	14	15.00	28.50	13,202.00	1.28	168.99
2264 Wool scouring	12	15.00	28.50	13,202.00	1.28	168.99
2362 Knit goods manufacturing (including yarn manufacturing)	120	7.35	24.35	57,704.00	.33	196.12
2363 Knitting mills	26	6.00	18.00	8,307.00	.48	39.87
2501 Clothing manufacturing	214	9.60	35.10	169,601.00	.23	390.08

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
2521 Shirt manufacturing	24	8.00	38.50	14,560.00	.26	37.86
2570 Mattress manufacturing (no spring, wire or excelsior manufacturing)	24	16.00	112.50	22,885.00	.98	22.28
2574 Awning and tent manufacturing	24	18.85	44.00	5,411.50	.54	24.11
2581 Laundries N. O. C.	87	13.85	44.00	55,310.00	1.13	6,275.01
2584 Dressing and cleaning	31	9.50	39.25	30,430.00	1.13	3,431.97
2589 Saddlery manufacturing	88	15.75	39.00	89,833.00	.38	341.37
2681 Harness and saddle manufacturing	88	15.75	39.00	89,833.00	.38	341.37
2702 Logging and lumbering	55	6.20	41.80	53,295.00	.63	335.76
2712 Excelsior manufacturing	70	15.00	37.50	63,241.00	5.09	3,218.97
2731 Planing and moulding mills	1	18.00	18.00	110,986.00	5.34	49.98
2732 Picture frame manufacturing	40	15.25	28.45	110,911.50	1.33	2,354.25
2742 Cooperage (wood)	5	18.75	43.50	7,315.00	2.03	75.03
2749 Box manufacturing (wood)	5	18.75	43.50	7,312.00	2.03	146.40
2763 Box manufacturing (wood assembling)	3	6.00	45.00	9,973.00	3.07	306.18
2767 Box manufacturing (wood assembling)	3	6.00	30.00	1,904.00	2.03	38.65
2803 Carpentry	2	19.20	19.20	2,400.00	2.03	48.12
2804 Coffin and casket manufacturing	9	34.50	37.60	12,932.00	2.33	301.32
2812 Cabinet makers	22	18.25	37.60	13,260.00	2.33	269.18
2813 Cabinet makers	2	18.25	37.60	1,936.00	2.33	40.26
3000 Steel works (open hearth)	75	18.00	18.00	30,772.00	1.35	12.64
3015 Rolling mills (bars only)	175	18.00	60.00	149,999.00	4.26	1,310.89
3030 Steel shop (fabricating, assembling, etc.)	64	20.20	43.25	33,102.00	2.81	4,214.97
3065 Tinsmith shop	7	7.75	37.60	7,047.00	3.37	1,115.54
					1.40	98.66

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
3066 Sheet metal works (shop only)	142	13.40	39.10	167,408.00	1.40	2,343.71
3084 Foundries, N. O. C.	108	17.60	47.20	140,922.00	1.48	2,085.65
3107 Blacksmithing (not shoeing)	24	27.25	34.85	24,864.00	1.85	469.40
3110 Tinsmithing	24	10.00	23.00	11,216.00	.68	198.69
3160 Gas and electric fixture manufacturing	25	6.00	32.50	2,994.00	12.21	365.57
3166 Scaffolding	6	6.00	32.50	2,994.00	12.21	365.57
3220 Tinsmithing	135	7.70	51.70	125,146.00	2.93	2,540.46
3301 Mattress manufacturing	4	19.12	19.12	3,371.00	1.40	47.19
3360 Oxy-acetylene (including cutting and welding)	1	21.00	21.00	1,092.00	2.67	29.16
3383 Jewelry manufacturing	11	11.00	50.00	16,530.00	.41	67.77
3565 Typewriter repair	8	12.00	27.00	9,822.00	.41	54.00
3566 Adding machine repair	8	12.00	27.00	9,822.00	.41	54.00
3631 Machine shop (with foundry)	13	23.55	30.75	13,004.00	2.67	347.21
3632 Machine shop (without foundry)	203	11.70	46.85	278,840.00	1.48	4,126.96
3643 Electric apparatus manufacturing	158	21.00	45.10	198,673.00	1.28	2,543.01
3661 Repair telephone and telegraph apparatus	36	18.50	43.00	39,090.00	.98	383.08
3724 Millwright work	12	13.35	23.10	8,651.00	.41	86.47
3726 Motor (steam) installation and repair	131	30.45	43.46	66,399.00	2.13	1,383.90
3807 Automobile radiator manufacturing	4	7.00	35.00	1,820.00	.68	12.38
3811 Auto body manufacturing (including assembling)	4	4.00	37.50	4,866.00	1.48	72.91
3850 Motorcycle parts manufacturing	13	18.00	30.00	14,040.00	1.92	143.20
	1	20.00	28.75	1,177.00	.56	10.12

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
3864 Carriage and wagon manufacturing	14	12.00	34.70	18,229.00	1.78	374.48
4000 Sand and gravel digging (no excavating, grading or blasting)	6	32.80	49.25	4,364.00	3.70	181.47
4029 Brick manufacturing (no underground mine)	115	18.60	29.75	80,923.00	1.78	1,440.43
4033 Tile manufacturing (roof and drainage)	41	22.50	40.40	29,758.00	1.78	529.70
4141 Concrete block manufacturing	5	18.40	32.50	4,318.00	.58	251.65
4131 Mortar and concrete block making	5	29.40	32.70	4,315.00	.58	32.97
4150 Optical goods manufacturing N. O. C.	11	10.00	30.00	10,120.00	.68	68.92
4152 Eyeglass and spectacle manufacturing	10	6.00	30.00	10,146.00	.68	68.99
4240 Box manufacturing (solid paper boxes, no paper or board manufacturing)	77	6.75	40.00	47,710.00	1.10	524.81
4241 Box manufacturing (folding paper boxes, no paper or board mfg.)	40	8.00	48.75	18,542.00	1.28	237.34
4300 Printing (no division of payroll)	235	9.85	36.35	242,083.00	.58	1,404.08
4302 Lithographing	13	12.00	32.00	19,126.00	.58	1,092.12
4304 Stationery and bookbinding	346	8.90	40.50	237,725.00	1.10	1,567.77
4307 Bookbinding (no division of payroll)	91	6.90	36.85	50,500.00	.31	156.55
4352 Engraving N. O. C.	3	30.00	40.00	5,442.00	.51	27.75
4361 Photographic studio	6	7.00	35.00	5,564.00	.28	15.58
4362 Motion pictures (film exchange)	23	12.75	50.00	29,595.00	.63	186.45
4418 Rubber stamp and pad manufacturing	3	8.00	38.50	3,177.00	1.23	39.08
4501 Chemical manufacturing N. O. C.	173	24.15	62.00	232,171.00	.67	6,198.93
4534 Salt manufacturing	375	14.11	32.75	359,491.00	.58	8,348.88
4558 Paint manufacturing (no lead manufacturing)	63	14.50	23.25	4,582.00	1.78	81.56
4607 Pharmacies	65	26.60	30.50	65,385.00	.56	365.88
4634 Oxygen and hydrogen manufacturing	2	18.75	33.75	2,359.00	3.37	86.24

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
4692 Dental laboratories	9	5.00	36.00	7,777.00	.56	43.55
4693 Pharmaceutical and surgical goods manufacturing	6	8.00	12.00	2,534.00	.56	1.33
4720 Soap manufacturing	4	10.00	35.00	1,337.00	1.40	19.00
4740 Oil refining (petroleum)	248	10.00	75.00	381,814.00	1.53	5,841.75
4741 Tar manufacturing	7	21.00	62.50	10,097.00	1.68	1,699.53
4921 Photographic sensitive films and dry plates (dev. of negative only)	7	5.40	25.00	3,999.00	.68	27.19
4921 Masonry N. O. C.	44	32.50	56.55	36,600.00	5.09	1,862.94
5025 Construction block, tile, concrete block, frame, etc.)	4	37.00	57.50	27,866.00	3.99	1,911.59
5040 Iron working, steel	24	37.00	57.50	28,862.00	3.99	1,911.59
5040 Tanks, metal, erecting N. O. C.	7	48.00	57.00	10,462.00	16.14	1,059.33
5081 Iron work, erecting balconies and fire escapes	1	6.12	96.73	1,447.00	6.41	92.75
5100 Elevator erection (passenger and freight)	11	6.12	96.73	7,812.00	2.23	174.20
5181 Furnace installation	6	16.50	27.00	1,530.00	1.23	18.82
5182 Gas, steam and hot water apparatus fitting, including installation of flues	6	16.50	27.00	1,530.00	1.23	18.82
5183 Plumbing (including shop and outside)	81	17.40	41.15	59,946.00	1.13	677.39
5184 Steam pipes (laying cork or other non-conducting materials to same)	20	20.40	43.15	38,115.00	1.13	677.39
5188 Automatic sprinkler	5	24.00	25.25	3,111.00	1.13	12.55
5190 Electrical equipment	8	24.00	42.00	4,292.00	2.13	91.42
5200 Electrical equipment (installation and repairs)	39	23.70	42.60	45,477.00	1.18	536.83
5204 Concrete work, buildings (not grain elevators, no blasting)	151	24.55	38.75	83,465.00	5.09	4,248.37
5204 Concrete mixers (mechanical)	2	14.37	146.08	1,359.00	5.09	69.17
5208 Concrete work (grain elevators)	75	45.00	45.00	79,656.00	5.09	7,169.04
5209 Concrete work (foundations for buildings)	173	23.40	35.75	45,296.00	3.37	2,365.06

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
5210 Concrete work (retaining walls, no tunneling).....	85	23.60	42.50	11,468.00	3.37	386.47
5341 Marble and stone setting (inside only).....	2	15.00	36.00	3,007.00	.78	23.45
5344 Tile installation (not fireproofing, interior).....	16	26.95	34.85	9,111.00	.78	71.06
5347 Plaster block partitions (erections inside of building).....	10	21.50	49.50	15,117.00	2.03	306.88
5401 Carpentry N. O. C.	385	25.00	39.50	248,098.00	5.99	12,458.39
5407 Carpentry installation of interior trim.....	65	32.45	44.70	52,262.00	.39	486.91
5461 Painting and decorating (interior trim).....	5	36.30	36.30	7,455.00	3.70	275.83
Painting and decorating (interior shop (not exterior work, excluding painting of structures and bridges)	9	29.65	31.70	12,432.00	3.52	437.60
5462 Glaziers (away from shop).....	2	33.00	41.00	188.00	5.09	9.57
5473 Plastering N. O. C. (outside of building).....	56	30.05	38.35	71,860.00	3.70	2,658.82
5474 Painting and decorating (away from shop).....	27	28.00	45.00	45,768.00	1.48	1,065.64
5480 Plastering N. O. C. (interior work away from shop).....	27	28.00	45.00	36,302.00	1.48	1,065.64
5490 Painting and decorating.....	11	23.15	36.35	11,239.00	1.18	132.62
5500 Paving N. O. C. (floor or pavement).....	115	18.00	48.00	80,225.00	1.18	1,187.33
5502 Concrete work (artificial stone or concrete).....	103	27.25	37.55	33,332.00	1.48	1,493.31
5503 Asphalt laying (street or sidewalk, including yard and shop).....	117	16.00	41.00	100,648.00	1.48	1,895.59
5543 Roofing N. O. C.	10	14.35	37.55	4,029.00	4.97	240.04
5562 Additions, alterations and repair of existing buildings or plants.....	8	20.00	38.05	6,011.00	3.70	275.98
5563 Additions, alterations and repair of existing buildings or plants.....	8	22.75	37.70	9,120.00	3.07	375.98
5606 Contractors, general offices, superintendent, etc.	38	14.55	76.10	82,599.00	1.85	1,528.08
5642 Contract, masonry and concrete, carpentry, etc.	238	21.00	38.65	134,857.00	2.13	2,872.45
5643 Contract, interior trim and cabinet making.....	115	31.60	41.85	65,270.00	1.74	1,161.80

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
Contract, cellar excavations	14	20.10	23.40	7,053.00	2.13	50.08
5614 Wrecking (not marine, no blasting)	14	20.10	23.40	7,053.00	2.13	50.08
6030 Surchasing in construction works	37	33.25	38.25	22,388.00	13.38	51.91
6031 Grading land (no canal or cellar excavation)	37	33.25	38.25	22,388.00	13.38	51.91
6011 Municipal road making	265	21.50	49.60	50,357.00	1.85	1,571.79
6104 Railroad construction (electric, horse or cable)	291	19.75	68.40	157,784.00	2.55	4,023.50
6292 Oil producing (excluding the shooting of wells)	11	10.00	21.00	170,150.00	3.37	5,725.06
6220 Cellar excavation retaining walls, etc., no blasting	39	22.15	47.30	21,896.00	5.34	1,169.25
6227 Cellar excavation (no blasting)	249	20.70	35.10	188,310.00	2.23	4,199.31
Cellar excavation (no blasting or subaqueous work and no blasting; depth 12 ft.)	4			4,376.00	3.22	140.90
6280 Blasting, powder (including the manufacture of)	76	23.30	28.45	109,476.00	16.10	17,725.64
6300 Sewer building (no limit of depth)	60	21.50	67.65	42,775.00	6.41	2,741.88
6320 Steam heating	6	33.65	46.00	5,232.00	2.43	127.14
6321 Waterworks (no tunneling or blasting)	3	18.75	24.75	1,594.00	3.52	54.00
6322 Irrigation pipe (laying of)	30	22.80	30.00	95,482.00	3.52	151.77
6330 Construction of large canals	10	22.80	30.00	65,482.00	3.52	151.77
7101 Railroad employees (excluding shop employees)	19	24.60	37.15	31,233.00	6.00	1,573.98
7102 Railroad operation (steam)	21	24.50	52.50	19,888.00	7.03	1,398.13
7103 Railroad shop employees	2	33.25	42.00	2,436.00	2.03	49.45
7127 Shop employees, light and traction co.	44	37.00	70.00	32,501.00	1.48	481.02
7128 Railroad operation (street railroads)	540	16.10	81.50	674,779.00	1.68	11,886.30
7201 Livery and boarding stables	5	14.00	42.00	1,525.00	2.33	175.33

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
7205 Drivers and drivers' helpers N. O. C.	614	20.10	27.50	514,283.00	1.53	7,898.53
7214 Coal merchants (receiving or shipping by land or water where no power is used)	8	21.55	21.55	6,320.00	2.13	134.61
7215 Breweries (with or without bottling)	6	20.75	36.50	3,938.00	2.34	91.96
7219 Truckmen	109	24.85	34.20	120,465.00	2.80	3,373.02
7240 Refrigerator cars, loading, unloading, etc.	33	25.00	62.50	14,175.00	3.70	524.37
7380 Chauffeurs and chauffeurs' helpers, commercial, N. O. C.	1,051	22.65	32.25	1,133,466.00	1.28	14,508.36
7388 Breweries, with or without bottling (chauffeurs and chauffeurs' helpers)	7	18.00	30.00	6,438.00	2.34	150.67
7400 Gas works, installation, inspection and repairs	107	19.45	34.20	134,889.00	1.93	2,216.74
7520 Water works, including water supply and sewerage work	107	19.45	34.20	134,889.00	1.93	2,216.74
7530 Electric light and power line construction (transmission line, not for local distributors)	43	18.40	18.25	36,645.00	1.23	436.73
7531 Electric light and power companies (operation, maintenance, extension of lines and service connection)	461	18.50	62.50	482,515.00	4.24	20,458.64
7532 Electric light and power companies (operation, maintenance, extension of lines, not including construction and repair work only)	97	19.20	41.25	67,103.00	4.24	2,845.17
7533 Electrical construction and repair work only	56	20.85	48.15	71,291.00	4.24	3,092.74
7570 Steam heating or power companies (not electric; operation of plant only; no construction)	20	17.55	51.15	21,375.00	1.23	273.60
7600 Telegraph and telephone companies (operation, maintenance, extension of line and light connection)	24	16.05	35.65	29,445.00	2.13	627.18
7703 City firemen	462	16.35	34.05	561,650.00	2.55	14,322.08
7720 Policemen	113	24.50	46.35	121,620.00	3.87	4,706.69
	266	20.00	46.00	266,630.00	2.35	6,773.56

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH
July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
8000 Department stores	952	8.65	128.80	847,187.00	.33	2,795.22
8002 Soft-drink dealers (retail)	4	15.05	30.00	3,381.00	.48	1,677.19
8003 Butcheries (retail or provision stores)	196	18.55	30.00	211,981.00	.38	1,874.49
8006 Groceries (retail)	48	10.10	22.00	58,551.00	.16	917.60
8007 Dry goods stores (no manufacturing)	786	7.10	49.15	198,302.00	.37	92.83
8008 Clothing stores (retail, no manufacturing)	189	11.65	45.30	33,509.00	.16	682.70
8010 Jewellery stores (wholesale, no manufacturing)	222	17.75	37.20	229,225.00	.37	1,818.15
8013 Furniture stores (wholesale and retail)	42	19.05	49.10	53,223.00	.16	1,987.06
8016 Store risks (wholesale N. O. C.)	187	17.00	47.00	249,103.00	.46	33.62
8027 Fish, oyster and poultry dealers	381	16.50	44.70	431,969.00	.78	4,079.82
8028 Store risks (retail) N. O. C.	3	20.00	30.00	1,407,079.00	.28	181.34
8029 Five and ten-cent stores or stores advertising goods at a maximum or seed minimum price	1,454	11.10	35.25	50,376.00	.36	33.60
8102 Seed merchants (including operation of seed sorting machine)	70	5.50	62.50	33,391.00	.46	166.56
8103 Wool merchants (including warehouse)	44	17.30	35.00	15,929.00	.78	65.17
8104 Store, agricultural implements	12	21.00	35.00	11,354.00	.58	309.85
8105 Leather and shoe findings	20	22.55	36.15	39,721.00	.78	81.64
8117 Machinery dealers (store only)	11	14.15	26.15	96,416.00	1.60	4,176.46
8203 Plumbers' supply dealer (shop only, no manufacturing)	27	23.05	117.20	7,271.00	.78	309.85
8207 Lumber yards (including storage and harvest)	11	21.15	39.15	261,028.00	.32	81.64
8207 Lumber yards (commercial only, not mill hazard)	246	16.70	39.80	261,028.00	1.60	4,176.46

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
8212 Bottle dealers (second hand)	13	20.00	26.50	10,067.00	1.93	191.29
8213 Hay, straw and feed dealers	16	15.00	30.00	2,649.00	1.28	33.91
8214 Flour dealers (no milling)	22	21.00	36.00	28,436.00	1.28	363.96
8221 Coal merchants (receiving or shipping by land where power machinery is used)	21			7,324.00	2.55	186.76
8222 Coal merchants (receiving or shipping by land, no power machinery being used)	101	18.45	32.99	79,200.00	2.13	1,686.96
8224 Fuel and material dealers (coal, ice, kindling or firewood)	86	19.50	28.70	100,302.00	2.13	2,136.43
8226 Feed and material dealers (lumber, hay, grain, feed, agricultural implements)	14	17.40	30.00	11,183.00	1.60	178.93
8227 Contractors' equipment and material	6	24.00	46.25	3,952.00	1.60	63.23
8260 Junk dealers (shop and outside, no wrecking or buildings, no blasting)	8	18.00	21.00	7,440.00	6.71	499.22
8284 Live stock (commercial merchants and salesmen)	6	34.40	83.65	17,502.00	1.18	206.52
8285 Stock yards (with or without R. R. yards, with or without slaughtering)	33	18.35	56.10	33,763.00	5.03	1,595.26
8291 Cold storage (warehouse operation)	6	15.75	32.25	5,136.00	2.54	130.45
8291 Insurance (general merchandise N. O. C.)	139	17.50	39.20	133,731.00	1.85	2,474.02
8301 Oil distributing (line or terminal operations)	17	12.00	36.00	13,519.00	2.44	298.42
8310 Oil distributing	17	12.00	36.00	9,254.00	2.44	298.42
8380 Auto dealers (with or without garage)	596	15.75	62.60	808,432.00	.86	6,952.52
8392 Robber tire dealers (sale, repair and vulcanizing)	57	19.10	50.20	68,898.00	.86	592.52
8399 Gas and oil supply stations (supplying autos and motor boats)	5	17.50	27.50	5,200.00	1.68	87.36
8420 Inspection of mercantile, manufacturing and marine risks for insurance and valuation purposes	8	38.85	63.85	17,395.00	.51	88.71

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
8741 Real estate agents' employees (outside of office, no construction)	5	11.25	50.00	8,941.00	.13	11.62
8742 Salesmen, collectors and messengers (outside, not using autos)	1,765	23.90	40.35	2,511,950.00	.13	3,265.54
8745 News agents	23	18.50	20.75	10,702.00	1.85	197.99
8810 Clerical office employees	6,914	15.00	44.40	8,630,054.00	.08	6,904.04
8811 Draughtsmen (engaged, excluding in that profession, office duties only)	5	15.00	55.00	9,338.00	.78	72.84
8830 Asylums, hospitals, professional employees	124	27.00	38.50	18,573.00	.43	8,000.35
8832 Dentists, all other employees	24	27.00	87.50	42,740.00	.43	18,835
8833 Domestic workers, ex. domestic science and manual training	208	24.05	41.35	314,538.00	.13	408.91
8860 Teachers, N. O. C.	1,439	12.75	57.50	1,557,334.00	.08	1,245.87
8866 Y. M. C. A. teachers and preachers	4	28.12	38.13	4,417.00	.08	3.53
8901 Telegraph and telephone companies, office and exchange, employees only	988	10.10	51.95	817,403.00	.13	1,062.62
9001 Building, office or mercantile contractors for janitor work	145	13.00	23.55	91,377.00	.88	804.11
9007 Office buildings, employees	313	11.00	18.90	195,592.00	.96	1,877.68
9040 Asylums, hospitals (employees except professional help, drivers and laundries), helpers, chauffeurs and chauffeurs' helpers, or power laundries	209	16.15	33.00	100,321.00	.53	531.70
9050 Hotel employees (excluding laundry)	475	8.65	24.05	372,795.00	.51	1,906.25
9066 Country clubs	15	13.50	37.50	17,226.00	.51	87.06
9070 Lunch rooms	11	9.55	20.00	8,324.00	.43	14.40
9071 Restaurants	297	11.95	40.50	272,154.00	.43	1,170.16
9072 Club houses (not athletic, country or yacht)	87	11.30	35.50	51,534.00	.51	262.82

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH

July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
9078 Commissary work (employees engaged in furnishing board for employees in manufacturing, lumbering or contracting risks, not exposed to mechanical hazard)	193	8.50	28.75	101,211.00	1.08	1,093.84
9084 Bowling and billiard hall C., buildings, care and maintenance of	25	12.50	22.50	15,544.00	.73	114.35
9100 Colleges and schools with stage, theater, care of premises	37	10.40	26.15	225,045.00	.88	1,980.10
9152 Theater companies, motion picture theaters	191	16.45	37.15	26,267.00	.88	231.15
9154 Theater employees (including managers, not stage managers; box office, ushers and others not employed upon the stage)	215	8.45	45.00	166,878.00	.31	517.32
9181 Baseball clubs and parks (all players including umpires)	52	9.75	80.00	51,216.00	.16	81.95
9183 Bath houses and bathing pavilions (beach)	14	50.00	100.00	35,092.00	.25	461.35
9402 Street cleaning (including drivers, etc.)	22	13.45	18.45	18,748.00	1.87	351.59
9403 Garbage collecting (including drivers and chauffeurs)	37	25.10	47.00	195,620.00	3.52	6,885.82
9410 Municipal, township, county and state N. O. C.	388	16.17	60.00	28,125.00	3.52	990.00
9501 Painting (shop only)	4	23.90	31.65	5,866.00	.73	42.52
9505 Painting, automobile and carriage (bodies only)	9	23.00	40.00	12,165.00	.73	88.37
9520 Upholstering (away from shop)	3	25.00	35.00	4,440.00	.56	24.92
9525 Coffin and casket manufacturing (upholstery work and manufacturing burial garments)	5	10.00	25.00	3,066.00	.56	17.28
9541 Sign painting or lettering on buildings or structures	5	12.00	37.50	7,014.00	.23	9.13
9589 Barber shop	13	10.00	44.00	18,093.00	3.37	609.73
	47	25.80	48.35	67,869.00	.46	312.20

TABLE SHOWING CLASSIFICATION OF PAYROLL, RATES AND PREMIUMS ON ALL
EMPLOYMENT COVERED BY COMPENSATION ACT IN THE STATE OF UTAH
July 1, 1918, to June 30, 1919—Table VI—(Continued)

Class	Average No. Employees	Average Minimum Weekly Wage	Average Maximum Weekly Wage	Pay Roll	Rate	Premium
9583 Hairdressing for women	1	10.00	15.00	10,600.00	.28	29.68
9590 Blacksmithing, shoeing	1	25.00	34.50	5,013.00	1.72	86.72
9600 Taxidermians	1	25.00	25.00	1,500.00	1.03	15.45
9610 Motion pictures (production of, all operations up to the development of negatives)	6	33.30	60.00	6,371.00	1.78	113.40
9620 Undertakers	11	23.60	56.10	20,060.00	1.03	206.41
9630 Ice harvesting and storing only (including drivers and drivers' helpers and chauffeurs)	79	17.50	41.25	12,378.00	5.84	722.92
TOTAL	51,807			\$65,931,286.00		\$ 1,367,895.78

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1918, to June 30, 1919—Table VIII

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
1001	July 13, 1918	1	1	1					\$ 150.00	\$ 1,800.00	\$ 1,800.00		Settlement pending
1001	July 26, 1918								62.10	4,500.00			
1001	Aug. 10, 1918								160.00		\$ 1,500.00		Settlement pending
1001	Aug. 30, 1918				1				150.00		1,500.00		
1001	Sept. 10, 1918								189.50		3,450.00		
1001	Oct. 16, 1918								149.18		4,100.00		
1001	Oct. 27, 1918								150.00		4,250.00		
1001	Nov. 14, 1918	1	4	1					189.68				
1001	Nov. 19, 1918	1	1	1					130.00				
1001	Nov. 28, 1918								133.00	4,500.00	1,700.00		Settlement pending
1001	Jan. 8, 1919		4						298.81	4,500.00			
1001	Jan. 13, 1919	1	1	1					150.00	4,500.00			
1001	Jan. 18, 1919	1	1	1					150.00	4,500.00			
1001	Jan. 20, 1919	1	1	1					133.21				
1001	Jan. 22, 1919	1	1	1					150.00		3,200.00		Settlement pending
1001	Feb. 10, 1919	1	4						132.00				
1001	Feb. 10, 1919				1				77.00				
1001	March 7, 1919								150.00	4,500.00			Settlement pending
1001	March 27, 1919								150.00				
1001	April 12, 1919	1	3	1									
1001	June 8, 1919	1											
1001	June 28, 1919	1											
Total		12	25	15	1	4		1	\$ 2,403.96	28,800.00	19,700.00		Settlement pending Dependents in Austria

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1918, to June 30, 1919—Table VIII—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
1140	July 4, 1918	1	1	2					240.00	2,800.00	4,025.00		Agreement
1140	July 27, 1918	1	1	2					150.00	7,000.00	7,000.00		
1140	July 28, 1918	1	4				1		150.00				
1140	Sept. 23, 1918						1		150.00				
1140	Oct. 18, 1918						1		150.00				
1140	Oct. 18, 1918								150.00		1,500.00		Other costs, \$417.06
1140	Oct. 22, 1918								165.00	4,500.00			Settlement pending
1140	Oct. 31, 1918	1	5			1			150.00		1,700.00		Other costs, \$825.26
1140	Nov. 2, 1918	1	1								3,000.00		Other costs, \$530.40
1140	Dec. 4, 1918	1	1	2					150.00	1,150.00			Decision of Commission sustained by District and Supreme Courts
1140	Dec. 9, 1918									4,208.88			No dependency alleged
1140	Dec. 27, 1918	1	1										Settlement pending
1140	Dec. 28, 1918												Other costs, \$482.70
1140	Jan. 2, 1919	1	10										
1140	Jan. 19, 1919									1,500.00			
1140	Feb. 6, 1919	1							150.00		4,000.00		Settlement pending
1140	Feb. 24, 1919	1	2								1,000.00		\$500 paid by Co.
1140	March 20, 1919								100.00		2,000.00		
1140	March 26, 1919	1	4	1									Other costs, \$482.70

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1918, to June 30, 1919—Table VIII—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
1140	March 30, 1919	1	1							4,025.00			Funeral, \$299.50; attorney's fees, \$95.00; allowed by Court
	Total	11	35	8		1	3		\$ 1,405.00	\$ 18,183.88	\$ 24,225.00		
1430	Nov. 9, 1918	1	5						150.00	4,500.00			
1441	June 25, 1919					1			150.00				
1452	Aug. 11, 1918	1	1								3,250.00		
1452	Oct. 3, 1918	1	3								3,500.00		
1452	Oct. 22, 1918	1	3								3,838.81		
	Total	3	6								10,588.81		
1701	Aug. 18, 1918						1		150.00			\$ 750.00	Court costs, \$376.20
2030	Dec. 13, 1918	1	2						150.00	4,500.00			
2030	Dec. 17, 1918	1	6						150.00	2,000.00			
2030	Dec. 23, 1918			1					150.00				Agreement with Sugar Company Non-Industrial
2039	March 19, 1919	1	6					1					
	Total	3	14	1				1	450.00	10,883.60			

FATAL CASES—CLASSIFICATION, BENEFITS AND DEPENDENCY
July 1, 1918, to June 30, 1919—Table VIII—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Burial, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
2090	Jan. 30, 1919	1	6						320.65	3,500.00			Settlement pending
3015	Aug. 6, 1918	1	1						155.00	1,800.00			
5183	Jan. 28, 1919			2					150.00	4,500.00			
5204	Dec. 18, 1918	1	2						150.00	75.00			
5206	June 11, 1919	1	2						150.00		2,412.00		Widow re-married
5642	May 5, 1919	1	5					1	150.00	2,970.24			
6042	Aug. 19, 1918	1	2					1	155.00				
6042	Sept. 16, 1918							1	305.00	2,970.24			
	Total	1	2						\$ 150.00				
6104	Feb. 26, 1919						1		\$ 305.00				
6104	May 27, 1919								150.00				
6104	June 27, 1919	1							305.00				
	Total	1							\$ 666.00		2,500.00		
7500	Feb. 9, 1919			2			1			2,000.00	2,500.00		

July 1, 1918, to June 30, 1919—Table VIII—(Continued)

Class	Date of Death	Widow	Total Children	Father and Mother	Others	Uncertain	No Dependents	Non-Industrial	Larceny, Med. and Transportation, Amount	Settled Under the Compensation Act, Amount	Settled in Court for, Amount	Paid to S. I. F., Amount	Remarks
7531	July 7, 1918	1	1					1	150.00	3,943.68			
7531	Sept. 25, 1918								114.50	2,188.40			
7531	Sept. 25, 1918			2					150.00	4,500.00			
7531	Jan. 15, 1919	1	1						150.00	4,500.00			
7531	May 16, 1919	1											
	Total	3	2	2				1	\$ 564.50	\$ 15,112.08			
8224	Nov. 20, 1918	1	2						\$ 172.00	4,500.00			
8742	June 26, 1919												
9050	Oct. 16, 1918	1	1	2					120.00	5,000.00			
	Grand total	42	108	32	1	7	5	4	\$ 7,712.23	1,085.76	63,925.81	750.00	Third party, \$5,000

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING

July 1, 1918, to June 30, 1919—Table IX

Class	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount Specific Award for Dismemberment, Loss of Use or Function:
TOTAL DISABILITIES						
1140 Loss of both eyes	2	55% of the average weekly wage for five years from date of injury				
1441 Loss of leg and arm	1	40% of such average weekly wage until death. Total medical expense, \$600.00				
Total	3					
PARTIAL DISABILITIES						
2030 Loss of arm, between wrist and elbow	1	Exclusion	87	\$120.00	160	\$1,225.00
1001 Loss of arm, use of right forearm	1	200.00	815	672.00	156	700.00
4730 Loss of arm, partial loss use	1	274.75	100	154.32	Award	833.12
8007 Loss of hand, 50 per cent use of right	1	26.00	27	42.00	75	833.12
1452 Loss of hand, part of metacarpal bones	1	66.00	42	42.00	103	1,225.00
2011 Loss of thumb	1	12.20	42	57.12	20	190.40
1001 Loss of thumb	1	27.00	27	48.00	20	240.00
3015 Loss of thumb, distal phalanx	1	37.00	39	66.88	30	360.00
9300 Loss of thumb, distal phalanx	1	13.00	10	19.89	50	360.00
1001 Loss of thumb, distal phalanx	1	20.00	10	19.89	50	360.00

July 1, 1918, to June 30, 1919—Table IX—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks Award	Amount	Specific Award for Dismemberment, Loss of Use or Function:
4740	Loss of thumb, distal phalanx	1	38.00	24	44.25	20	240.00	
4740	Loss of thumb, distal phalanx (four fingers, entire)	1	165.75			Award	1,944.00	
2804	Loss of thumb, distal and one-half proximal phalanx	1	200.00	76	182.00	Award	695.58	
1452	Loss of finger, index, distal phalanx	1	Exclusion	28	180.00	25	300.00	
2030	Loss of finger, index, distal phalanx	1	Exclusion	9	14.64	10	120.00	
9050	Loss of finger, index, distal phalanx	1	67.00	47	62.28	10	92.80	
1452	Loss of finger, index, distal and middle phalanx	1	10.00	6	12.00	10	120.00	
1001	Loss of finger, index, distal, middle and one-half proximal phalanx	1	Exclusion	160	270.26	25	300.00	
1001	Loss of finger, index, distal, middle and middle phalanx	1	Exclusion	10	19.53	13	156.00	
1001	Loss of finger, index, distal and middle phalanx	1	Exclusion	28	180.00	15	180.00	
1140	Loss of finger, index, distal and middle phalanx	1	Exclusion	21	35.00	15	180.00	
1140	Loss of finger, index, distal and middle phalanx	1	Exclusion	17	38.00	15	180.00	
4524	Loss of finger, index, one-half distal phalanx	1	25.00	78	132.00	12 1/2	150.00	
6042	Loss of finger, index, bone	1	Exclusion	25	45.96			
2731	Loss of finger, index, bone removed (tip of thumb)	1	15.00	25	36.32			
8380	Loss of finger, index and middle distal phalanx	1	43.20		270.00	15	180.00	
3204	Loss of finger, index, middle and ring, distal phalanx	1	18.00	133	270.00	32	440.00	
1430	Loss of finger, index, middle and little distal phalanx	1	62.00	9	15.75	35	420.00	
1001	Loss of finger, index, middle and middle	1	Exclusion	21	60.00	35	420.00	
1001	Loss of finger, index, middle, ring and little	1	70.06	35	60.00	56	672.00	
4524	Loss of finger, middle, distal phalanx	1	16.50	20	18.03	8	91.03	
1140	Loss of finger, middle, distal phalanx	1	Exclusion	43	74.38	4	122.38	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING.
July 1, 1918, to June 30, 1919—Table IX—(Continued)

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount	Specific Award for Dismemberment, Loss of Use of Function:
1001	Loss of finger, middle, distal phalanx	1	20.00	19	33.85	5	60.00	
2050	Loss of finger, middle, distal phalanx	1	68.50	50	96.38	3	36.00	
1140	Loss of finger, middle, one-half distal phalanx	1	19.50	14	15.08	5	60.00	
1140	Loss of finger, middle, one-half distal phalanx	1	19.50	14	15.08	5	60.00	
8742	Loss of finger, middle, one-half distal phalanx	1	60.00	33	33.00	15	30.00	
6361	Loss of finger, middle, ring and little, with metacarpal bones	1	160.30	21	36.00	62	744.00	
2030	Loss of finger, middle, ring and little	1	63.50	56	87.84	36	395.28	
5401	Loss of finger, middle, ring and little, distal phalanx	1	2.94	19	31.86	12	140.76	
9003	Loss of finger, middle and ring, distal phalanx	1	52.00	49	49.00	9	63.00	
1140	Loss of finger, middle, distal phalanx	1	52.00	49	49.00	9	63.00	
7340	Loss of finger, ring, distal phalanx	1	31.00	23	58.94	4	48.00	
1432	Loss of finger, ring, distal phalanx	1	31.00	23	58.94	4	48.00	
1001	Loss of finger, ring, distal and middle phalanx	1	Exclusion	27	48.00	4	48.00	
6104	Loss of finger, ring, distal and middle phalanx	1	127.00	48	72.00	8	96.00	
9050	Loss of finger, ring, distal and one-half middle phalanx	1	26.00	122	210.39	8	96.00	
9050	Loss of finger, ring, distal and one-half middle phalanx (tip of little)	1	26.00	42	72.00	6	62.64	
1001	Loss of finger, little, distal and middle phalanx	1	Exclusion	29	50.52	6	72.00	
1140	Loss of finger, little, distal phalanx	1	Exclusion	18	24.00	6	60.00	
1140	Loss of finger, little, one-half distal phalanx	1	135.00	42	84.00	9	108.00	
3811	Loss of finger, little	1	5.00	7	10.31	9	92.79	
2801	Loss of finger, little	1	120.50	108	119.30	9	67.14	

PERMANENT INJURIES—BENEFITS PAID AND OUTSTANDING—(Continued)

July 1, 1918, to June 30, 1919

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount	
							Specific Award for Dismemberment, Loss of Use or Function:	
1140	Loss of finger, little	1	Exclusion	81	138.00	9		108.00
8003	Loss of finger, ends of three	1	28.00	213	213.00			1,800.00
1001	Loss of leg, above knee	1	174.56	393	674.38	150		4,500.00
1001	Loss of leg, fractured (may be permanent total)	1	309.60	85	146.15	18	Agreement	213.85
1410	Loss of leg, permanently disabled	1	Exclusion	128	194.11	140		1,680.00
1432	Loss of leg, right knee and ankle	1	Exclusion	128	194.11	150		1,800.00
1001	Loss of leg, little above middle of thigh	1	200.00			150		1,800.00
1001	Loss of leg, at knee	1	200.00			150		1,800.00
1001	Loss of ankle, use of	1	230.00	273	488.00	Agreement		1,000.00
2000	Loss of foot	1	200.00	184	94.00	191		1,500.00
2030	Loss of foot at ankle	1	200.00	184	94.00	191		1,500.00
1140	Loss of foot, three metatarsal bones	1	200.00	277	462.00	15		120.00
1140	Loss of toe, great and third	1	200.00	69	120.00	15		180.00
1001	Loss of toe, first, distal phalanx	1	30.49	152	232.00	21		252.00
1622	Loss of toe, second	1	85.00	50	85.00	3		35.70
1441	Loss of toe, second	1	Exclusion	319	547.82			
1140	Loss of toe, second	1	Exclusion	41	72.00	6		72.00
1432	Loss of toe, second	1	Exclusion	78	135.15	4½		54.00
1140	Loss of toe, second, distal phalanx	1	54.00	37	64.02	3		36.00
1140	Loss of toe, fourth, distal phalanx	1	Exclusion	10	19.89	3		36.00
1140	Loss of eye, sight, one	1	Exclusion	393	540.00	100		1,200.00
1140	Loss of eye, sight, one	1	Exclusion	87	132.00	120		1,440.00

PERMANENT INJURIES—BENEFITS PAID OUT AND OUTSTANDING—(Continued)

July 1, 1918, to June 30, 1919

Class	PARTIAL DISABILITIES	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount	
							Specific Award for Dismemberment, Loss of Use or Function:	
1140	Loss of eye, sight, one	1	Exclusion	154	264.00	100	1,200.00	
1140	Loss of eye, sight, one	1	199.00	56	86.00	100	1,200.00	
2090	Loss of eye, sight, one	1	173.50	89	89.00	100	700.00	
1140	Loss of eye, sight, one	1	Exclusion	51	86.72	100	1,200.00	
1441	Loss of eye, sight, one	1	Exclusion	23	33.06	71	810.11	
2121	Loss of eye, partial sight, one	1	60.00	23	33.06	75	764.50	
1001	Loss of eye, enucleation	1	378.10	39	46.03	100	1,314.00	
1001	Loss of eye, enucleation	1	175.35	87	95.16	100	1,314.00	
8010	Loss of eye, enucleation	1	175.35	87	95.16	60	941.80	
8103	Loss of eye, enucleation	1	203.75	63	107.10	120	1,376.05	
1441	Loss of eye, enucleation	1	Exclusion	17	36.00	120	1,408.40	
1140	Loss of eye, enucleation	1	Exclusion	13	24.00	120	1,361.90	
1140	Loss of eye, enucleation	1	Exclusion	34	84.00	120	1,440.00	
1001	Loss of hearing	1	Exclusion	416	515.00	120	1,385.12	
1001	Loss of teeth, eight	1	14.00	10	11.14			
Grand total, permanent partials		95	\$5,778.85	6800	\$10,057.56	3996½	\$55,730.27	

PARTIAL DISABILITIES

Summary

Class	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount	Specific Award for Loss of Use or Dismemberment, Function:
1001	22	2,028.21	2716	3,558.61	861	15,974.90	
1140	13	345.00	1223	1,563.00	81 1/2	10,435.00	
1430	1	Exclusion	336	583.82	81 1/2	10,435.00	
1441	3	Exclusion	387	644.37	191	2,172.01	
1452	6	Exclusion	50	85.00	301 1/2	3,618.00	
1622	2	8.50	184	94.00	103	1,411.75	
2000	1	200.00	12	51.12	20	707.00	
2010	1	12.20	42	51.12	20	190.40	
2014	1	345.00	121	252.33	33 1/2	3,971.28	
2080	5	332.00	121	89.00	100	700.00	
2090	1	173.50	89	33.06	75	754.50	
2121	1	60.00	23	36.32	75	754.50	
2731	1	15.00	25	36.32	9	762.72	
2804	2	320.90	184	251.36	9	360.00	
3100	1	37.00	39	66.88	30	360.00	
3140	1	37.00	39	66.88	30	360.00	
3632	1	35.00	39	44.03	120	1,440.00	
3811	1	5.00	7	10.31	9	92.79	
4524	2	41.50	98	150.03	20 1/2	241.03	
4740	3	403.75	24	44.25	290	5,316.15	
5204	1	174.00	133	224.00	62	744.00	
5401	1	2.94	19	31.86	12	140.76	
6042	1	Exclusion	25	45.96	12	140.76	

PARTIAL DISABILITIES—(Continued)

Summary

Class	No.	Med.	Time Lost Due to Total Disability, Days	Compensation Paid for Total Disability	Weeks	Amount	Specific Award for Loss of Use or Dismemberment, Function:
6104	1	127.00	122	210.39	8	96.00	
7381	1	160.30	21	38.99	62	748.00	
7382	1	80.00	21	38.99	62	468.00	
8003	2	80.00	262	262.00	9	83.00	
8007	1	66.00	42	42.00	75	525.00	
8010	1	175.25	87	95.16	60	941.80	
8028	1	19.50	14	15.08			
8108	1	293.75	63	107.10	120	1,408.40	
8380	3	185.48	100	424.82	16	1,168.00	
8389	1	80.00	47	62.28	22	218.08	
9050	2	119.00	47	62.28	22	218.08	
9410	1	309.60	85	146.15	18	213.85	

STATE OF UTAH,

COUNTY OF SALT LAKE

} ss.

P. A. THATCHER, WM. M. KNERR, W. P. MONSON,
being first duly, severally sworn, each upon his oath de-
poses and says:

That he is a member of The Industrial Commission of
Utah; that he has read the foregoing report and knows
the contents thereof, and that the statements therein made
are true to the best knowledge, information and belief of
affiant.

P. A. THATCHER

WM. M. KNERR

W. P. MONSON.

Subscribed and sworn to before me this 15th day of
December, 1920.

C. I. SMITH,

Notary Public.

My Commission Expires August 6, 1921.

(SEAL)

UTAH MANUFACTURES, 1918

As no funds were available for a field worker to assist in gathering statistics for 1918 the returns are very incomplete. Many concerns failed to answer repeated inquiries. The following summarizes the returns made.

Name of Industry	Establishments Reporting	Capital Invested	Value of Raw Material	Value of Products	Wages, Total Amount Paid	Average No. of Male Employees	Average No. of Female Employees
Bakers	11	\$ 554,500	\$ 978,335	\$1,508,297	\$ 242,303	193	79
Box Manufacturers	3	100,575	147,387	260,000	73,577	36	66
Candy Manufacturers	19	1,531,520	2,750,685	4,075,921	577,728	603	850
Canning	16	1,664,924	1,065,371	3,640,439	580,513	616	868
Cement and Plaster	7	447,485	20,184	214,564	143,500	142	2
Creameries	13	1,017,256	2,376,533	4,376,956	409,841	298	95
Engravers	2	10,000	18,274	184,232	45,632	30	10
Ice Manufacturers	3	230,000	42,700	205,177	94,074	60	2
Knitting Manufact'g	8	742,000	687,134	1,019,931	190,426	112	281
Mattress and Bedding	2	14,000	25,300	47,680	8,962	4	4
Meat Packing	6	4,403,000	6,350,345	9,052,587	489,475	399	79
Metal Workers	22	1,677,559	2,703,102	3,637,883	832,464	343	4
Flour and Grist Mills	50	1,847,525	3,230,188	3,791,732	261,961	219	16
Miscellaneous	30	6,924,375	3,194,823	5,326,206	776,970	730	107
Pickling and Vinegar	4	35,000	16,684	32,450	10,559	8	6
Salt and Non-Minerals other than coal	11	5,221,275	472,556	1,998,284	861,975	567	21
Soda Water	11	462,500	282,230	710,312	136,656	115	27
Tailors	4	318,000	189,709	417,709	133,304	46	142

UTAH MANUFACTURES, 1919

As no funds were available for a field worker to assist in gathering statistics for 1919 the returns are very incomplete. Many concerns failed to answer repeated inquiries. The following summarizes the returns made.

Name of Industry	Establishments Reporting	Capital Invested	Value of Raw Material	Value of Products	Wages, Total Amount Paid	Average No. of Male Employees	Average No. of Female Employees
Bakeries	27	\$ 630,500	\$ 994,422	\$1,593,001	\$ 276,586	184	47
Brick and Tile	7	611,800	4,210	610,486	254,940	271	5
Canneries	22	2,075,724	1,309,497	3,796,323	691,056	780	1017
Cement and Lime Manufacturers	7	2,052,322	176,898	1,219,164	359,279	318	4
Cigar Manufacturing	9	65,349	64,638	167,159	54,644	32	14
Confectioneries	23	1,778,942	2,159,533	3,600,863	727,844	378	523
Creameries	14	1,085,392	1,938,383	4,318,334	333,307	238	80
Flour and Cereal Mfg.	57	1,356,832	3,466,506	3,982,052	241,642	176	12
Harness and Leather Goods	17	261,719	98,655	183,365	83,372	58	3
Hosiery and Knit Goods	2	767,424	837,536	1,385,269	235,891	122	275
Metal and Sheet Iron Workers	29	1,677,559	2,663,102	3,637,883	832,464	343	4
Miscellaneous	3	3,008,500	182,000	519,500	192,143	100	23
Salt	3	1,023,650	2,250	557,846	128,191	74	6
Sheet Metal Workers	21	414,682	706,331	1,288,815	580,973	382	12
Slaughter Houses	33	2,662,750	2,161,602	2,663,034	187,500	177	9
Soft Drinks, Mineral and Soda Water	11	448,922	177,578	551,668	169,281	116	16

UTAH
AGRICULTURAL
STATISTICS

1919 - 1920

UNITED STATES DEPARTMENT OF AGRICULTURE

Bureau of Crop Estimates

Co-operating With

THE INDUSTRIAL COMMISSION OF UTAH

State Statistician

AGRICULTURAL DEPARTMENT

Miner M. Justin, Agricultural Statistician

Vera Rose, Stenographer

U. S. DEPARTMENT OF AGRICULTURE

Bureau of Crop Estimates.

THE INDUSTRIAL COMMISSION OF UTAH

State Statistician.

The following estimates of crop acreages, yields, production and value, of Utah crops for 1920 are made by the Bureau of Crop Estimates. Comparisons are made with 1919. Acreages, production and values are in thousands, i. e., 000 omitted.

CROP	Acres (thousands)		Yield per Acre		Unit	Total Production		Farm Value Nov. 1st	
	1920	1919	1920	1919		1920	1919	1920	1919
Winter Wheat	156	164	15.0	10.5	Bu.	2,344	1,720	3,961	3,526
Spring Wheat	133	140	24.4	13.0	"	3,242	1,960	5,479	4,018
Corn	33	24	21.7	8.0	"	714	432	893	696
Oats	78	72	40.3	34.0	"	3,130	2,448	2,567	2,424
Barley	20	24	40.3	30.0	"	798	720	806	1,073
Rye	20	18	8.3	7.0	"	169	126	193	272
Potatoes	17	17	194	141	"	3,238	2,397	2,526	2,972
Clover Seed	1.3	1	6.0	7.0	"	8	7	72	70
Alfalfa Seed	16	12	4.9	4.5	"	77	54	693	648
HAY—									
Timothy	10	35	2.00	1.90	Tons	20	61	280	1,305
Clover	5	8	2.40	1.90	"	13	15	169	332
Timothy and Clover	33	21	2.20	1.90	"	73	40	986	870
Alfalfa	393	340	2.83	2.23	"	1,113	760	13,356	15,580
Grain Hay	9	25	.70	.75	"	6	19	66	338
Other Tame	21	24	1.90	1.70	"	41	41	574	877
ALL TAME HAY	472	453	2.68	2.07	"	1,266	938	15,431	19,302
Wild Hay	116	88	1.30	1.10	"	151	97	1,661	1,727
TOTAL HAY	588	541	2.41	1.90	"	1,417	1,035	17,092	21,029
Apples					Bu.	918	779	1,285	1,246
Peaches					"	825	1,500	2,145	2,550
Pears					"	60	47	150	99
Sugar Beets	115	103	12.0	9.84	Tons	1,380	1,015	16,560	11,148
Total	1,177	1,113						54,422	51,771

THE AGRICULTURAL SEASON OF 1920

The winter of 1919-1920 was unusually cold in the early part and many peach blossoms were killed by the low temperatures. Because of the heavy feeding made necessary by the severe weather the short hay crop was exhausted early in the spring and heavy losses of stock occurred in many parts of the State. Precipitation was above or near average until the latter part of May when a severe drouth began. This lasted until August and injured dry land grain considerably. The supply of irrigation water was sufficient throughout the season.

Winter wheat was good though the yield per acre was not up to the average established when only the more favored sections were farmed. The average yield of spring wheat was reduced by the poor crop on unirrigated ground. The favorable spring and high prices of wheat caused rather large sowings on dry land.

The acreage of oats was increased partly as an alfalfa nurse crop. The yield was good though not remarkable. Barley also made good yields. The acreage was again reduced the third season in succession. Rye was grown on a larger area but made a rather small yield. Drouth caused much injury and heavy pasturing due to feed shortage was a considerable factor.

Potatoes in the State showed an unchanged acreage though there were numerous local shiftings. The season was favorable throughout and a heavy yield was harvested.

Corn made a remarkable increase in acreage and a somewhat larger yield than last year. The increasing number of silos is in part the reason for more corn but a very large acreage is grown on dry land in the southwestern part of the State where silos are rare.

An excellent hay crop was harvested from an increased acreage. Alfalfa is taking a more prominent place as a hay crop. Other tame hays show surprising shifts in acreage. It seems probable that this is simply a matter of different names for mixed grasses as the total area is little changed. Pasture and ranges have been better than usual the entire season. Livestock sent to market has been of good quality. The crop of lambs and calves was somewhat smaller than usual.

Sugar beets had a good season. The acreage is the largest ever grown and the yield excellent. The price of beets is high. The value of the crop is larger than that of

all the grains or the tame hay and is only slightly less than all hay values.

Peaches were injured by cold weather in the winter but the short crop was of greater value than the bumper crop of 1919 as prices were the highest ever received.

Apples were more productive than last year and were of very good quality. Other fruits produced fairly well in spite of some frost injury.

Canning peas made a good yield on an acreage larger than average. Tomatoes were excellent in yield though the acreage contracted was much smaller. Truck gardens were exceptionally good.

THE AGRICULTURAL SEASON OF 1919

The winter of 1918-1919 was deficient in precipitation which resulted in a severe shortage of irrigation water. The monthly precipitation was below normal from November to August with the single exception of February. The lack of moisture was aggravated by exceptionally high temperature throughout the growing season of 1919. Damaging frosts occurred about June 1. In September good rains fell and caused a great improvement in late crops. The last three months of the year were cold with heavy precipitation, which made beet and potato harvest very difficult. The extreme weather also made it necessary to begin feeding stock at an unusually early date.

The yields of practically all crops in Utah in 1919 were much below the average. This was due mainly to the drouth. Winter wheat was one of the worst sufferers, the yield per acre being the lowest ever reported. Spring wheat also suffered severely showing the lowest yield since 1893. This is in part due to a larger proportion of the acreage growing without irrigation compared with former years. Oats and barley acreages were reduced in favor of sugar beets and alfalfa. Their yields were also reduced because they were not irrigated when water became scarce, more valuable crops being favored. Potatoes were low in both acreage and yield. The Davis-Weber potato district made a much better showing than the rest of the State.

Hay was a light crop as damage was done by drouth and frost. The scarcity created by the short crop was aggravated by the severe weather which began in October and lasted until late in the spring. As pasture and ranges were poor throughout the season stock entered the winter in poor flesh. The average weight of lambs was low though an unusual percentage was marked.

Sugar beets made a splendid finish of an unfavorable season. Sevier County was seriously troubled by disease. The larger acreage enabled the State to produce a greater tonnage than ever before.

The peach crop was one of the largest ever produced and the quality was good. It was readily marketed at satisfactory prices.

Apples were abundant but the quality was poor. The size was below average and a high percentage was wormy. Cherries and pears were fairly good.

Tomatoes for canning made good yields. Peas were decidedly below average. High temperatures as they blossomed and neared maturity were generally held accountable. Market truck gardens were generally good.

UTAH FARM PRICES AND VALUES NOVEMBER 1

CROP	Unit	Price per Unit		Value per Acre	
		1920	1919	1920	1919
Winter Wheat	Bu.	\$ 1.69	\$ 2.05	\$ 25.30	\$ 21.53
Spring Wheat	"	1.69	2.05	41.24	26.65
Corn	"	1.26	1.65	27.34	29.70
Oats	"	.82	.99	33.05	33.66
Barley	"	1.01	1.48	40.70	44.70
Rye	"	1.14	2.16	9.46	15.12
Potatoes	"	.78	1.24	151.32	174.84
Alfalfa Hay	Ton	12.00	20.50	33.96	45.71
Wild Hay	"	11.00	17.80	14.30	19.58
Sugar Beets	"	12.00	11.00	144.00	108.24
Apples	Bu.	1.40	1.60		
Peaches	"	2.60	1.70		
Pears	"	2.50	2.10		

U. S. DEPARTMENT OF AGRICULTURE

Bureau of Crop Estimates.

THE INDUSTRIAL COMMISSION OF UTAH

State Statistician.

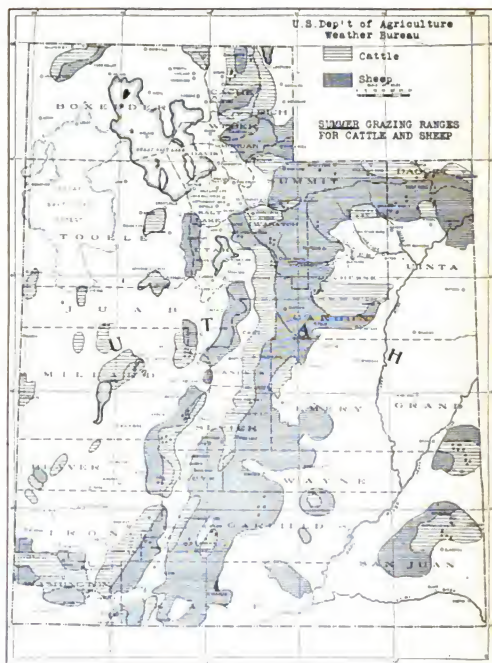
The Bureau of Crop Estimates makes the following estimates of livestock on farms and ranges in Utah on January 1:

		Number	Price Per Head	Total Value
HORSES—	1920	145,000	\$ 78.00	\$11,310,000
	1919	148,000	83.00	12,284,000
	1918	145,000	89.00	12,905,000
	1917	138,000	87.00	12,006,000
	1916	146,000	86.00	12,556,000
MULES—	1920	2,000	73.00	146,000
	1919	2,000	78.00	156,000
	1918	2,000	82.00	167,000
	1917	2,000	79.00	158,000
	1916	2,000	78.00	156,000
MILCH COWS—	1920	109,000	78.00	8,502,000
	1919	106,000	82.00	8,692,000
	1918	96,000	73.50	7,056,000
	1917	91,000	61.00	5,551,000
	1916	96,000	62.00	5,952,000
OTHER CATTLE—	1920	518,000	39.30	20,357,000
	1919	503,000	48.10	24,194,000
	1918	457,000	43.90	20,062,000
	1917	408,000	34.90	14,239,000
	1916	408,000	35.80	14,280,000
SHEEP—	1920	2,245,000	10.30	23,123,000
	1919	2,223,000	11.00	24,453,000
	1918	2,340,000	13.50	31,524,000
	1917	2,089,000	7.90	16,503,000
	1916	2,089,000	5.40	11,280,000
SWINE—	1920	114,000	15.00	1,710,000
	1919	133,000	20.20	2,686,000
	1918	102,000	20.00	2,040,000
	1917	101,000	10.50	1,060,000
	1916	112,000	7.80	873,000

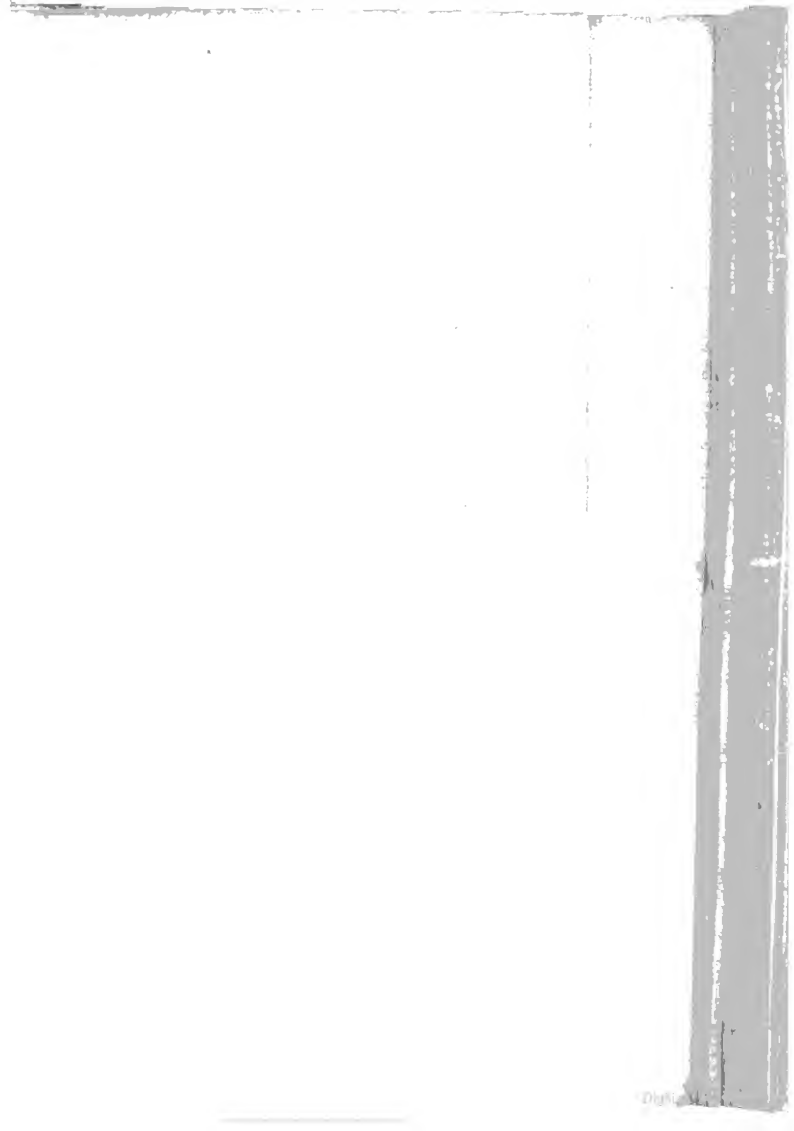
STATEMENT—SHOWING NUMBER OF LIVE STOCK AND ASSESSMENT IN THE STATE OF UTAH
FOR THE YEAR 1920. (From State Board of Equalization.)

Counties	HORSES AND MULES				CATTLE				SHEEP				GOATS				SWINE				TOTAL	
	On Range		Otherwise Assessed		On Range		Otherwise Assessed		On Range		Otherwise Assessed		On Range		Otherwise Assessed		On Range		Otherwise Assessed			
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value		
Beaver	369	\$ 8,540	1,088	\$ 73,376	7,930	\$ 267,715	1,088	\$ 50,005	129,834	\$ 1,031,150	1,689	\$ 37,125	112	\$ 715	1,501	\$ 12,940	1,300	\$ 12,600	1,482	\$ 465	2,010	\$ 1,440
Box Elder	2,901	83,435	5,027	386,830	17,452	558,540	3,930	200,160	88,945	701,495	4,550	72,380			696	6,885	696	6,885	1,169	772	1,169	772
Cache	2,129	64,155	5,704	378,730	8,511	249,832	8,698	456,615	13,838	133,555	172	3,212	13,364	97,263	299	1,634	299	1,634	196	659	196	659
Carbon	360	13,730	753	57,620	2,036	71,986	68	10,760	10,049	77,400	118	3,500	300	1,200	3,206	31,900	3,206	31,900	682	215	682	215
Daguerre	283	6,520	309	20,800	1,966	71,986	68	10,760	10,049	77,400	118	3,500	300	1,200	3,206	31,900	3,206	31,900	682	215	682	215
Davis	1,438	49,405	2,433	202,445	4,358	149,815	3,445	212,470	2,921	17,700	350	17,500			1,200	3,206	1,200	3,206	1,355	386	1,355	386
Duchesne	1,692	36,835	2,682	176,405	14,152	565,705	3,265	86,227	58,749	458,527	3,152	20,143	1,192	8,172	1,018	6,368	1,018	6,368	1,355	386	1,355	386
Emery	2,779	47,632	1,661	108,805	18,329	636,783	1,544	78,531	56,137	457,580	907	16,340	6,402	56,349	1,199	9,473	1,199	9,473	1,411	565	1,411	565
Garfield	479	10,632	1,440	69,310	12,415	427,083	521	24,331	52,892	92,327	17,180	155,806	415	2,075	896	3,896	896	3,896	1,460	699	1,460	699
Grand	376	12,167	645	39,385	8,216	315,428	241	11,220	103,309	92,327	17,180	155,806	415	2,075	896	3,896	896	3,896	1,460	699	1,460	699
Idaho	587	13,885	1,374	89,703	8,785	279,607	832	39,660	132,631	646,615	4,352	32,255	600	2,150	1,274	5,565	1,274	5,565	1,423	482	1,423	482
Juniper	1,485	40,645	1,366	114,120	9,544	378,565	3,424	21,290	114,715	867,329	1,540	38,500	14,000	81,000	115	1,023	1,023	1,023	1,307	418	1,307	418
Kane	140	4,910	596	48,120	6,925	243,679	6,447	284,980	301,965	2,412,879	5,996	128,495	104	626	2,098	21,840	2,098	21,840	3,771	804	3,771	804
Millard	1,304	29,640	3,891	268,665	19,331	624,679	6,447	284,980	301,965	2,412,879	5,996	128,495	104	626	2,098	21,840	2,098	21,840	3,771	804	3,771	804
Morgan	465	11,325	656	49,655	4,602	162,895	583	29,720	494	3,952					45	488	45	488	350	900	350	900
Platte	475	11,310	646	68,165	6,495	212,982	682	41,164	6,177	49,524	14	325	94	506	488	3,029	488	3,029	380	900	380	900
Rich	1,431	28,770	590	28,775	16,183	531,255	356	16,616	23,182	185,556	150	3,000	924	4,370	1,187	15,905	1,187	15,905	1,768	835	1,768	835
Salt Lake	1,539	19,585	1,064	98,665	19,180	685,600	1,092	51,525	25,143	234,833	1,553	38,075	53	530	2,081	21,186	2,081	21,186	1,423	482	1,423	482
Sanpete	2,034	97,755	2,624	249,940	12,839	573,331	7,702	398,455	38,217	338,110	5,671	118,349			2,089	19,663	2,089	19,663	1,768	835	1,768	835
Sevier	1,155	81,690	1,244	96,725	12,839	406,565	2,764	139,875	7,078	50,675	775	12,750	15	125	767	15,595	767	15,595	5,943	215	5,943	215
Summit	786	8,140	1,426	94,883	6,261	205,981	918	41,810	186,906	1,684,286	3,355	68,857	1,937	15,595	526	5,943	526	5,943	2,125	495	2,125	495
Tooele	3,808	51,285	2,452	198,570	13,701	368,460	1,657	81,755	128,451	1,031,159	2,234	39,663	403	3,443	905	8,069	905	8,069	1,782	394	1,782	394
Utah	2,630	110,943	4,798	394,005	22,335	674,785	6,816	351,405	29,631	225,260	1,601	34,104			705	6,650	705	6,650	1,797	144	1,797	144
Wasatch	414	12,302	892	77,931	6,382	234,842	1,729	90,410	29,631	225,260	1,601	34,104			705	6,650	705	6,650	1,797	144	1,797	144
Washington	318	12,305	1,759	116,950	9,455	368,360	1,184	71,190	27,449	238,525	78	355	1,938	9,440	781	5,611	781	5,611	504	191	504	191
Wayne	811	22,830	3,397	216,918	5,064	157,100	5,035	236,602	10,240	81,460			5	30	2,541	22,730	2,541	22,730	737	670	737	670
Weber																						
Totals	33,586	\$920,374	60,238	\$4,349,771	302,318	\$9,336,481	75,528	\$3,760,762	1,677,000	\$13,684,117	58,810	\$955,589	44,364	\$295,909	29,657	\$273,411						

NOTE: • 350 head of buffalo at \$17,500 are listed in this column.







PERCENTAGES OF UTAH CROP ACREAGES IRRIGATED IN 1920

From Assessor's Statistical Reports

Counties	All Crops	Corn	Oats	Barley	Rye	Wntr. Wht.	Sprg. Wht.	Po- tatoes
Beaver	99	100	94	100	100	75	99	100
Box Elder	57	81	88	54	5	5	51	98
Cache	65	63	81	46	32	3	54	95
Carbon	99	100	97			6	97	100
Daguerre	*100		*100	*100		*100	*100	*100
Davis	88	88	59	80	13	37	93	98
Duchesne	99.7	100	97	100		100	99	100
Emery	100	100	100	100	100	100	100	100
Garfield	*74	*59	*75	*70	*50	*45	*70	*90
Grand	99	98	97	100		100	46	100
Iron	87	48	99	99	3	60	96	97
Juab	44	93	98	89	5	3	31	96
Kane	48	9	10	14	1	33	24	54
Millard	*72	*96	*96	*94	*5	*39	*75	*98
Morran	89	99	100	100	60	9	92	100
Piute	100	100	100	100	100	100	100	100
Rich	98	100	100	100	78	16	54	96
Salt Lake	89	87	95	94	41	16	93	100
San Juan	39	0	5			0	5	0
Sanpete	79	81	88	88	5	12	72	93
Sevier	99.7	98	100	93	62	60	100	100
Summit	*95	*100	*99	*100	*60	*55	*96	*100
Towe	*66	*90	*96	*89	*20	*8	*62	*99
Uintah	99.6	99	100	100	16	84	98	100
Utah	91	91	96	91	18	35	94	96
Wasatch	100		100	100		100	100	100
Washington	69	39	90	97	50	42	67	52
Wayne	*100	*100	*100	*100	*100	*100	*100	*100
Weber	92	70	87	72	8	40	76	97
State	78.8	66	87	77	10	10	78	97

* Estimated.

Note: Sugar beets and hay crops are nearly all grown under irrigation. The portion not irrigated is so small it was considered negligible.

STATEMENT OF NUMBER OF FARMS, ACRES IN CROPS AND FALLOW

New Ground Cropped and Number of Silos for Utah in 1920
Estimated From Reports of Assessors and Crop Reporters

COUNTIES	Census, 1920	Number of Farms		Acres Crops	Acres Fallow, 1920	New Land Cropped, 1920	Number of Silos
		Assessor Reported	Estimated Total				
Beaver	373	147	375	17,447	3,100	51	8
Box Elder	1,859	944	1,875	124,013	42,000	68	38
Cache	2,242	1,608	2,250	131,271	32,600	392	57
Carbon	235	203	235	12,784	40	138	
Daggett	37	57	60	3,408	†		
Davis	1,174	956	1,200	32,304	2,260	81	58
Duchesne	1,248	291	1,300	47,674	2,260	386	
Emery	759	480	780	30,586	570	435	8
Garfield	540	236	540	19,869	†		
Grand	114	105	114	5,537	276		
Iron	647	446	650	30,451	1,740	740	3
Juab	419	392	455	35,126	16,100	960	22
Kane	229	115	230	8,501	460	26	
Milard	1,037	1,171	1,350	92,780	†		
Morgan	239	163	240	11,016	710		
Plute	246	192	250	11,642			
Rich	224	161	224	42,149	875		
Salt Lake	2,438	637	2,450	59,213	4,780	120	12
San Juan	405	97	405	21,260	8,470	1,320	
Sanpete	1,813	818	1,820	86,680	12,950	330	
Sevier	1,108	711	1,120	51,697	2,000	64	
Summit	520	380	520	37,794	†		
Tooele	418	135	420	36,125	†		
Uintah	899	528	900	38,157	635	1,045	
Utah	3,237	1,810	3,300	98,901	7,000	460	97
Wasatch	508	405	510	21,296	248		
Washington	738	405	750	16,050	1,300		
Wayne	272	235	275	9,720	†		
Weber	1,688	1,226	1,700	44,074	6,950	42	10
STATE	25,664	12,784	26,298	1,178,025	147,324	6,644	313

†No data as to acreage fallowed available.

*1918 or 1919 figures. Not included in State total of number of farms.

UTAH

ACREAGES OF CEREALS, POTATOES AND SUGAR
BEETS PLANTED IN UTAH IN 1920

Estimated From Reports of Assessors and Crop Reporters

COUNTIES	Acres of Cereals for Grain						Acres	Acres
	Corn	Oats	Barley	Rye	Winter Wheat	Spring Wheat	Potatoes	Sugar Beets
Beaver	610	1,015	179	23	40	2,320	310	
Box Elder	700	2,720	3,460	1,500	42,800	12,500	700	19,050
Cache	1,840	4,455	2,430	76	35,300	12,530	1,650	25,000
Carbon	600	850	160	12	150	810	265	130
Daggett	4	818		1		420	46	
Davis	970	590	1,080	188	4,420	2,672	1,450	7,620
Duchesne	196	4,950	500		900	5,800	520	40
Emery	1,200	5,600	200	30	25	5,960	600	
Garfield	1,380	3,360	280	500	290	2,500	354	
Grand	690	202	20			41	32	165
Iron	6,000	2,500	830	580	455	3,620	475	80
Juab	1,050	992	368	3,000	16,000	1,700	350	500
Kane	2,400	975	8	326	450	360	30	
Millard	1,300	2,240	1,300	10,000	16,000	8,180	440	10,291
Morgan		1,250	520	15	1,190	1,800	400	380
Piute	38	1,860	118	108		1,360	140	
Rich	7	2,100	400	220	545	1,220	94	
Salt Lake	1,800	2,350	1,020	150	6,760	10,000	2,000	9,350
San Juan	1,230	4,800			2,900	2,660	190	
Sanpete	430	6,600	1,335	1,240	11,000	15,100	700	5,150
Sevier	208	5,780	515	157	157	7,000	510	7,200
Summit	2	2,310	575	80	1,430	1,245	140	
Tooele	250	1,400	400	1,250	14,000	3,140	160	200
Utah	1,330	4,000	365	20	350	3,240	300	
Utah	3,800	6,000	2,400	765	7,550	15,820	2,630	18,500
Wasatch		1,870	212		248	2,800	200	520
Washington	4,000	300	250	90	3,140	1,650	60	
Wayne	260	1,730	300		120	1,380	180	
Weber	635	4,000	560	100	1,730	5,650	1,770	10,500
STATE	32,930	77,617	19,785	20,401	167,948	132,978	16,696	114,676

UTAH HAY ACREAGES, 1920

Estimated From Reports of Assessors and Crop Reporters

COUNTIES	Alfalfa	Sweet Clover	Clover	Timothy	Timothy and Clover Mixed	Other Tame Grasses or Hay	Grains for Hay	Wild Hay	All Tame Hay
Beaver	10,950				64	1,735	87	114	12,886
Box Elder	29,900	30	40	60	373	480	600	9,100	31,483
Cache	25,850	110	120	1,240	2,220	1,560	1,000	14,150	32,090
Carbon	7,100			15	32		40	2,620	7,187
Daggett	1,987			182					2,119
Davis	10,420	15	16	69	315	302	55	1,122	11,192
Duchesne	31,000	1,390	116	1,890	214	67	36	555	34,713
Emery	14,580	1,450	3	3			10	925	16,046
Garfield	7,000			1,880		760		1,565	9,640
Grand	4,350					15	22		4,387
Iron	14,820	4	62			165	95	765	15,146
Juab	7,670	28				3	265	3,200	7,966
Kane	2,870	10		20	110	630		312	3,640
Millard	33,600			94		740	5,500	3,095	39,934
Morgan	2,020	105	20	156	2,280			220	4,581
Piute	6,000			140	58			1,820	6,198
Rich	5,600	21		7	1,195	3,300	140	27,300	10,263
Salt Lake	25,200	15	46	62	30	96		210	25,449
San Juan	9,480								9,480
Sanpete	31,600	56	29	260	325	970	210	11,200	33,450
Sevier	25,400	3		450	125	268		3,920	26,226
Summit	670		70	722	9,680	6,400		14,460	17,542
Tooele	9,250		110	200	475	770		4,550	10,805
Uintah	26,550	882	6	82	53	790	82	107	28,445
Utah	26,200	274	180	390	462	1,950	348	11,200	29,794
Wasatch	775			10	12,500	148	124	1,575	13,557
Washington	6,560								6,560
Wayne	4,520			350				880	4,870
Weber	11,550	6	80	1,135	2,760	223	210	1,350	15,964
STATE	393,422	4,399	898	9,397	33,261	21,362	8,824	116,305	471,563

MISCELLANEOUS CROPS AND ITEMS FOR UTAH, 1920

Estimated From Assessor's Reports

COUNTIES	Number of Silos	Acres New Land Cropped 1920	Acres Alfalfa Seed Cut 1919	Acres Sweet Clover Seed 1919	Peas	Tomatoes
Beaver	8	51	815			
Box Elder	38	68	750			
Cache	57	392	136	1	1,750	
Carbon		138				
Daggett						
Davis	58	81	72		40	1,460
Duchesne		366				
Emery	8	435	862	1,000		
Garfield						
Grand						
Iron	3	740	310			
Juab	22	960	138			
Kane		26				
Millard					660	
Morgan						
Piute						
Rich						
Salt Lake	12	120	200			124
San Juan		1,320	5,120			
Sanpete		330			475	
Sevier		64			24	
Summit						
Towe						
Uintah		1,045	285	94		
Utah	97	460	64	186	62	400
Wasatch					316	
Washington						
Wayne						
Weber	10	42	30	3	1,160	655
STATE	313	6,644	8,782	1,284	4,487	2,639

ACREAGE, YIELD AND PRODUCTION OF WINTER WHEAT IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors, Crop Reporters
and Threshers

COUNTIES	Acres		Yield per Acre Bu.		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	40	258	24.0	8.0	960	2,064
Box Elder	39,400	41,200	14.0	11.0	551,600	454,200
Cache	31,800	32,512	18.0	16.0	572,400	520,000
Carbon	150	160	10.0	18.0	1,500	2,880
Daggett		35		20.0		700
Davis	4,420	5,940	24.0	16.7	106,080	99,000
Duchesne	882	1,200	22.0	3.9	19,360	4,680
Emery	25	200	30.0	5.0	750	960
Garfield	290	180	16.0	10.0	4,640	1,800
Grand		270		8.0		2,160
Iron	455	1,440	18.6	2.3	8,463	3,340
Juab	15,040	15,200	13.8	7.6	207,552	116,000
Kane	309	300	16.0	4.0	4,800	1,130
Millard	14,880	14,500	12.8	7.5	190,464	109,000
Morgan	1,190	850	23.0	16.4	27,370	13,990
Piute						
Rich	545	500	11.0	10.0	5,995	5,000
Salt Lake	6,460	6,700	12.8	7.6	82,688	50,400
San Juan	2,900	2,500	18.0	10.0	52,200	25,000
Sanpete	9,900	11,300	16.0	7.6	158,400	86,000
Sevier	157	634	20.0	20.8	3,140	13,200
Summit	1,430	1,100	22.0	4.0	3,146	4,400
Tooele	13,300	13,000	9.0	5.3	119,700	69,000
Uintah	350	800	24.0	4.2	8,400	3,400
Utah	7,320	7,550	18.2	9.6	133,224	72,550
Wasatch	246	111	23.0	7.0	5,658	777
Washington	2,826	2,400	12.7	11.6	35,890	27,800
Wayne	120	60	18.0	10.0	2,160	600
Weber	1,560	3,100	24.0	15.7	37,200	48,800
STATE	135,986	164,000	15.0	10.5	2,348,790	1,722,000

ACREAGE, YIELD AND PRODUCTION OF SPRING WHEAT IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors, Crop Reporters
and Threshers

COUNTIES	Acres		Yield per Acre Bu.		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	2,320	2,130	26.0	14.0	60,320	30,672
Box Elder	12,500	9,500	16.0	13.0	200,000	123,500
Cache	12,830	21,000	17.0	10.0	218,010	210,265
Carbon	810	1,210	28.0	10.0	22,680	12,100
Daggett	420	420	30.0	10.0	12,600	4,200
Davis	2,672	3,800	32.0	21.8	85,504	83,600
Duchesne	5,300	5,000	25.0	10.8	132,500	54,000
Emery	5,960	5,760	23.0	15.8	137,080	89,000
Garfield	2,500	2,900	16.0	13.8	40,000	27,000
Grand	41	290	26.0	18.0	1,066	5,200
Iron	3,620	3,500	28.0	7.4	101,360	25,900
Juab	1,700	4,100	15.0	4.0	25,500	16,400
Kane	360	600	20.0	10.0	7,200	6,000
Millard	8,180	9,300	17.0	7.0	139,060	65,000
Morgan	1,800	2,900	25.0	20.1	45,000	58,200
Piute	1,360	1,500	30.0	19.0	40,800	28,500
Rich	1,220	1,900	28.0	14.1	28,060	23,000
Salt Lake	10,000	11,600	28.0	17.1	280,000	198,360
San Juan	2,660	2,000	18.0	20.0	47,880	40,000
Sanpete	15,100	15,100	26.0	18.1	392,600	198,000
Serier	7,000	3,400	32.0	23.3	224,000	76,190
Summit	1,245	1,500	25.0	25.8	31,125	38,700
Tooele	3,140	3,000	21.0	7.2	65,940	21,600
Uintah	3,240	5,200	26.0	10.6	84,240	55,000
Utah	15,820	14,680	33.0	19.5	522,060	282,750
Wasatch	2,800	3,100	29.0	21.0	81,200	65,100
Washington	1,650	610	21.0	15.3	34,650	9,333
Wayne	1,380	1,400	25.0	16.4	34,500	23,000
Weber	5,650	3,600	27.0	24.0	152,550	87,840
STATE	182,978	189,720	24.4	14.0	3,242,485	1,960,000

ACREAGE, YIELD AND PRODUCTION OF OATS IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors, Crop Reporters
and Threshers

COUNTIES	Acres		Yield per Acre Bu.		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	1,015	1,140	36.0	39.2	36,540	44,688
Box Elder	2,720	2,700	47.0	42.0	127,840	113,400
Cache	4,455	4,300	40.0	42.7	178,200	183,610
Carbon	850	1,170	36.3	47.0	30,855	54,990
Daggett	818	818	48.0	25.0	39,264	20,450
Davis	590	620	43.0	43.0	25,370	26,660
Duchesne	4,950	4,100	40.0	29.0	198,000	82,000
Emery	5,600	6,250	37.0	27.5	207,200	171,875
Garfield	3,360	2,800	35.0	35.0	117,600	85,600
Grand	202	200	43.0	42.0	8,686	8,400
Iron	2,500	2,280	38.0	30.8	95,000	70,224
Juab	992	1,100	44.0	36.4	43,560	40,000
Kane	975	400	28.0	25.0	27,300	10,000
Millard	2,240	2,300	32.0	26.5	71,680	60,950
Morgan	1,250	1,380	50.0	54.0	62,500	74,520
Piute	1,860	1,300	35.0	30.0	65,100	39,000
Rich	2,100	3,400	50.0	35.7	105,000	121,040
Salt Lake	2,350	2,570	38.0	32.0	89,300	82,240
San Juan	4,800	2,600	31.0	24.0	148,800	62,400
Sanpete	6,600	6,900	47.0	34.4	310,300	236,670
Sevier	5,780	2,570	44.0	39.1	254,320	100,487
Summit	2,310	3,330	38.0	33.9	87,780	112,000
Tooele	1,400	1,100	42.0	49.0	58,800	53,900
Uintah	4,000	5,800	37.0	25.8	148,000	149,300
Utah	6,000	4,700	45.0	40.0	270,000	188,000
Wasatch	1,870	1,740	41.0	37.2	76,670	64,728
Washington	300	700	30.0	27.2	9,000	19,040
Wayne	1,730	1,620	38.0	35.8	65,740	57,996
Weber	4,000	2,400	43.0	43.0	172,000	115,200
STATE	77,617	72,250	40.3	34.0	3,130,405	2,448,000

ACREAGE, YIELD AND PRODUCTION OF BARLEY IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors, Crop Reporters
and Threshers

COUNTIES	Acres		Yield per Acre Bu.		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	179	480	34.0	34.8	6,086	16,704
Box Elder	3,463	3,200	29.0	28.0	100,340	89,600
Cache	2,430	2,500	24.0	27.0	58,320	67,500
Carbon	160	200	42.0	45.0	6,720	9,000
Daughters		1		15.0		15
Davis	1,080	1,300	32.0	32.7	34,560	42,510
Duchesne	500	1,600	40.0	25.0	20,000	40,000
Emery	200	250	48.0	21.0	9,600	5,250
Garfield	280	235	35.0	27.0	9,800	6,345
Grand	20	50	44.0	40.0	880	2,000
Iron	830	820	40.0	30.0	33,200	24,600
Juab	364	510	31.0	17.8	11,408	9,078
Kane	8	10	39.0	25.0	312	250
Millard	1,300	1,200	36.0	26.4	46,800	30,525
Morgan	520	400	42.0	42.0	21,840	16,800
Plute	118	200	37.0	25.0	4,365	5,000
Rich	400	600	47.0	32.0	18,800	19,200
Salt Lake	1,020	1,300	38.0	29.0	38,760	24,700
San Juan		50		18.0		900
Sanpete	1,335	1,800	36.0	27.7	48,060	49,860
Sewer	515	510	48.0	28.1	24,720	14,331
Summit	575	1,100	40.0	31.0	23,000	34,100
Tooele	400	2,800	39.0	37.0	15,600	103,600
Uintah	365	450	40.0	20.0	14,600	9,000
Utah	2,400	1,200	48.0	45.8	115,200	54,960
Wasatch	212	200	50.0	26.0	10,600	5,200
Washington	250	180	27.0	23.9	6,750	4,302
Wayne	300	260	38.0	26.0	11,400	6,500
Weber	560	850	32.0	30.2	17,920	25,170
STATE	19,785	24,256	35.9	30.0	709,641	720,000

ACREAGE, YIELD AND PRODUCTION OF CORN IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors and Crop
Reporters

COUNTIES	Acres		Yield per Acre Bu.		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	610	180	22.0	10.0	13,420	1,800
Box Elder	700	340	24.0	30.0	16,800	10,200
Cache	1,840	700	23.0	26.0	42,320	18,200
Carbon	600	672	25.0	13.0	15,000	8,733
Daggett	4	5	15.0	10.0	60	50
Davis	970	750	32.0	30.0	31,040	22,500
Duchesne	196	350	20.0	19.2	3,920	6,720
Emery	1,200	700	22.0	13.4	26,400	9,240
Garfield	1,380	600	16.0	10.0	22,080	6,000
Grand	690	620	34.0	42.5	23,460	26,350
Iron	6,000	5,280	17.0	10.0	102,000	52,800
Juab	1,050	630	21.0	19.5	22,050	12,285
Kane	2,400	1,300	18.0	14.0	43,200	18,200
Millard	1,300	1,200	27.0	27.0	35,100	32,400
Morgan						
Plute	38	10	30.0	25.0	1,140	250
Rich	7	5	15.0	20.0	105	100
Salt Lake	1,800	2,800	31.0	24.6	55,800	68,770
San Juan	1,230	900	18.0	20.0	22,140	18,000
Sanpete	430	360	23.0	24.0	9,890	8,640
Sevier	208	50	28.0	20.0	5,824	1,000
Summit	2		15.0		30	
Tooele	250	160	20.0	16.0	5,000	2,560
Uintah	1,380	1,090	10.0	22.0	13,800	22,760
Utah	3,800	3,180	32.0	15.9	121,600	50,562
Wasatch		30		20.0		600
Washington	4,000	1,760	15.0	10.0	60,000	17,600
Wayne	260	270	18.0	10.0	4,680	2,700
Weber	635	600	28.0	27.5	17,780	16,500
STATE	32,930	24,032	21.7	18.0	714,139	432,120

ACREAGE, YIELD AND PRODUCTION OF POTATOES IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors and Crop
Reporters

COUNTIES	Acres		Yield per Acre Bushels		Production Bushels	
	1920	1919	1920	1919	1920	1919
Beaver	310	340	190	131	58,900	40,460
Box Elder	700	700	143	159	100,100	111,300
Cache	1,650	1,580	220	160	363,000	252,800
Carbon	265	350	211	110	55,915	38,715
Daggett	46	48	208	95	9,568	4,560
Davis	1,450	1,600	190	165	275,500	265,360
Duchesne	520	420	166	117	86,320	49,140
Emery	600	460	195	134	117,000	61,640
Garfield	354	160	140	102	49,560	16,320
Grand	32	48	208	102	6,656	6,720
Iron	475	350	170	140	80,750	54,300
Juab	350	350	150	98	52,500	70,000
Kane	30	36	170	130	5,100	4,680
Millard	440	400	160	134	70,400	53,600
Morgan	400	240	200	152	80,000	36,480
Piute	140	150	100	40	14,000	6,000
Rich	94	120	100	130	9,400	15,600
Salt Lake	2,000	2,500	230	153	460,000	382,500
San Juan	190	200	207	53	39,330	10,000
Sanpete	700	645	128	109	89,600	72,305
Sevier	510	540	230	129	117,300	69,660
Summit	140	200	208	124	29,120	24,800
Tooele	160	168	175	165	28,000	17,820
Utah	300	450	200	120	60,000	54,000
Utah	2,630	2,300	170	146	447,100	335,800
Wasatch	200	270	200	75	40,000	20,250
Washington	60	185	180	134	10,800	38,190
Wayne	180	160	130	100	23,400	16,000
Weber	1,770	1,600	260	180	460,200	288,000
STATE	16,696	16,512	194	141	3,238,019	2,397,000

ACREAGE, YIELD AND PRODUCTION OF ALFALFA HAY IN UTAH, 1920 AND 1919

Estimates Based on Reports of Assessors and Crop
Reporters

COUNTIES	Acres		Yield per Acre Tons		Production Tons	
	1920	1919	1920	1919	1920	1919
Beaver	10,950	6,360	2.00	1.90	21,900	12,513
Box Elder	29,900	26,600	3.50	2.46	104,650	65,486
Cache	25,850	26,100	3.20	1.86	82,720	48,546
Carbon	7,100	6,900	3.10	1.90	22,010	13,110
Daggett	1,937	2,067	3.00	1.60	5,811	3,307
Davis	10,420	11,800	3.20	2.90	33,344	34,220
Duchesne	31,000	21,416	3.20	1.74	99,200	34,977
Emery	14,580	11,200	1.65	1.85	24,057	20,720
Garfield	7,000	4,500	3.00	2.11	21,000	10,128
Grand	4,350	2,100	2.40	4.00	10,440	8,400
Iron	14,820	11,900	2.25	1.97	33,345	23,443
Juab	7,670	7,620	3.15	2.10	24,160	16,002
Kane	2,870	1,200	2.80	2.70	8,036	3,240
Millard	33,600	29,220	2.00	2.30	67,200	67,206
Morgan	2,020	960	3.10	3.33	6,262	3,263
Piute	6,000	6,700	2.00	1.75	12,000	11,725
Rich	5,600	1,900	2.60	3.25	14,560	6,175
Salt Lake	25,200	20,900	3.20	3.15	80,640	65,835
San Juan	9,480	6,100	1.80	1.69	17,064	10,309
Sanpete	31,600	28,200	2.80	1.45	88,480	40,890
Sevier	25,400	23,200	3.10	2.88	78,740	66,816
Summit	670	1,400	2.50	1.36	1,675	1,904
Tooele	9,250	9,000	2.50	1.63	23,125	14,670
Uintah	26,550	22,800	3.00	1.40	79,650	31,920
Utah	26,200	26,700	3.00	3.00	78,600	80,000
Wasatch	775	400	3.00	1.84	2,325	786
Washington	6,560	4,960	4.00	2.86	26,240	14,186
Wayne	4,520	4,900	2.40	2.78	10,848	13,622
Weber	11,550	12,850	3.10	2.86	35,805	36,751
STATE	393,422	340,463	2.83	2.25	1,113,887	760,110

ACREAGE, YIELD AND PRODUCTION OF RYE AND WILD HAY IN UTAH, 1920

Estimates Based on Reports of Assessors and Crop
Reporters

COUNTIES	RYE			WILD HAY		
	Acres Har- vest- ed	Yield per Acre	Produc- tion, Bushels	Acres Har- vest- ed	Yield per Acre	Produc- tion, Tons
Beaver	23	20.0	460	114	1.00	114
Box Elder	1,500	7.5	11,250	9,100	2.10	19,110
Cache	76	10.0	760	14,500	1.55	22,475
Carbon	12	12.0	144	2,620	2.00	5,240
Daggett	1	12.0	12			
Davis	188	9.0	1,692	1,122	1.55	1,739
Duchesne				555	1.00	555
Emery	30	20.0	600	925	2.00	1,850
Garfield	500	12.0	6,000	1,565	1.00	1,565
Grand						
Iron	580	7.0	4,060	765	1.00	765
Juab	3,000	9.0	27,000	3,200	1.00	3,200
Kane	326	6.0	1,956	312	1.00	312
Millard	10,000	8.2	82,000	3,095	2.00	6,190
Morgan	15	12.0	180	220	1.55	1,430
Plute	106	9.0	972	1,820	1.00	1,820
Rich	220	15.0	3,300	27,300	1.00	27,300
Salt Lake	150	15.0	2,250	210	1.55	325
San Juan						
Sanpete	1,240	11.0	13,640	11,200	1.60	17,920
Sevier	157	15.0	2,355	3,920	1.10	4,312
Summit	80	12.0	960	14,450	1.00	14,450
Towe	1,220	4.0	4,880	4,550	1.00	4,550
Uintah	20	12.0	240	107	1.50	160
Utah	765	8.0	2,020	11,200	1.00	11,200
Wasatch				1,575	1.00	1,575
Washington	90	8.0	720			
Wayne				880	1.00	880
Weber	100	11.0	1,100	1,350	1.55	2,092
STATE	20,401	8.3	168,551	116,305	1.30	151,129

THE CLIMATE OF UTAH

By J. Cecil Alter, Meteorologist, United
States Weather Bureau.

Utah is situated in latitude 37 degrees to 42 degrees, which is the same as Kentucky and Indiana, and has a general altitude of from 3,000 to 7,000 feet above sea level; being also at a considerable distance from the ocean, its climate is semi-arid, of a well defined seasonal type, fairly representative of the middle temperate zone.

Owing to variations in topographical exposure there are rather wide varieties of climates within the State, the colder, moister regions being of limited extent in the mountains, and the warmer, drier sections are confined to the sheltered valleys at the lower altitudes of the extreme southern portion.

Temperature.

The general average annual temperature for the State is about 48 degrees, which is practically the same as for Iowa, though the Utah summers average appreciably cooler, considering the means of the maximum and minimum values, the winters very much milder. The climate of Utah is thus more equable than that of Iowa, though, typical of the elevated, arid regions, the daily ranges of temperature, from afternoon maximum to early morning minimum, are much greater in Utah.

For instance, the general average temperature for Utah for all Januarys of record is about 26 degrees, the warmest state average for January being 32 degrees and the coldest 15 degrees, within which limits all Januarys have fallen; while the general average January temperature in Iowa for all records is about 18 degrees, the warmest January state average being 28 degrees and the coldest 4 degrees, a range of 24 degrees over which the January mean has varied, as compared with 17 degrees for Utah.

Also, the general average July temperature for Utah, all Julys considered, is about 71 degrees, the warmest July being 75 degrees and the coldest being 68 degrees, an extreme range of only 7 degrees; while the general average for all Julys of record in Iowa, comprising about 28 years as do the Utah averages, is 74 degrees, the warmest state-

wide average being 82 degrees and the coolest 68, an extreme range of 14 degrees.

The mean annual temperature for Salt Lake City, which is fairly representative of the more densely populated portion of the State, is about 52 degrees, or the same as for Springfield, Illinois; though the summer means, for June, July and August combined, at Salt Lake City, is 72.5 degrees, and at Springfield, 74.5 degrees; and the winter means, for December, January and February, combined, at Salt Lake City, is 31.5 degrees and at Springfield, 29.1 degrees, these means being determined in the usual manner, of combining the highest and lowest temperatures daily.

The warmest valley in Utah, situated in the extreme southwestern portion, and represented by the weather records at St. George, has an annual mean temperature of 59 degrees, which is the same as for Oklahoma City, Oklahoma; though, owing to the wide daily range between the maximum and the minimum temperatures at St. George, its July mid-afternoon maximum temperatures for all records, average an even 100 degrees, or 20 degrees warmer than those for Oklahoma; and the average early-morning minimum temperatures for January at St. George is 22 degrees, or 12 degrees lower than similar values for Oklahoma City.

One of the higher valleys in Utah, in which a rather widely diversified agriculture is practiced, and represented by the weather records at Heber, has an annual mean temperature of 43.5 degrees, which is practically the same as for St. Paul, Minnesota. The July average afternoon maximum temperature at Heber is 86 degrees, or 13 degrees higher, and the January average early-morning minimum is 9 degrees, or 2.5 degrees lower than the similar values for St. Paul.

The severity of either the maximum or the minimum temperatures in Utah is greatly tempered by the dryness of the atmosphere and the infrequency of the storms, and the cold waves. The temperature changes from day to day in Utah are also very much more equable, the average change in the mean temperature from one day to the next being 4 degrees in winter at Salt Lake City and 8 degrees at St. Paul.

The mid-summer mean temperature, (mean of the maximum and minimum) at Salt Lake City, covering the last week in July and the first week in August, is practically the same as at Kansas City, Missouri, though because of the comparatively low relative humidity, the so-called "sensible" or wet bulb temperature, is approximately the same as for Sault Ste. Marie, upper Michigan.

The afternoon temperature in the principal settled portions of Utah will frequently reach the upper nineties in midsummer, and the early morning minimum values of zero are reached occasionally in midwinter in these areas, the valleys and settlements at the higher altitudes having zero temperatures more frequently. However, at Salt Lake City, twenty of the ninety winter days have minimum temperatures above freezing, indicating moderate winters.

The open growing season between the latest killing frost in spring and the earliest in autumn, has a wide range in Utah, varying from more than six months to the extreme southern regions to only a few weeks in the higher mountain valleys farther north; though in all districts the native vegetation and hardier crops make considerable growth before and after the killing frost dates. At Salt Lake City, representative of a large agricultural section, the season between killing frosts, on the average, is 182 days, which is the same as the open season at Springfield, Illinois.

Precipitation.

The general average precipitation for Utah is about one-third the average for Illinois, ranging from less than five inches over the so-called Great Salt Lake Desert, in interior northwestern Utah to more than twenty inches along the western slope of the Wasatch Mountains. This mountain range extends across the State from north to south about the middle, and intercepts the average storm tracks about at right angles.

The precipitation increases with altitude on the western slopes of the Wasatch from about 15 inches at 4250 feet altitude at the base to about 35 inches at 9,000 feet. The precipitation in these higher altitudes is very largely in the form of snow, which accumulates in storage from October to March, inclusive, from which frozen supplies the summer irrigation and electric power enterprises on the streams are supplied through the summer. The increased rainfall in summer at the greater altitudes serves also to sustain stream flow, and to support the summer pasturage on the mountain for cattle and sheep.

The principal agricultural areas immediately west of the Wasatch Mountains, receive from 14 to 18 inches of precipitation annually, while in eastern Utah the cultivated sections receive from 8 to 15 inches, excepting in extreme southeastern Utah where an important area of plateau lands receives from 15 to 20 inches. The areas receiving under 10 inches do not as a rule support an extensive agricultural industry, excepting in the Duchesne river basin in

northeastern Utah, where high mountains nearby provide irrigation water. The more arid regions of the State provide sufficient forage in summer for supporting the State's livestock at large, in winter, the winter snowfall being ample to provide the necessary livestock moisture.

The distribution of the precipitation in normal years is fairly heavy in winter, for western Utah particularly, when the mountain snow stores are accumulating, and much heaviest in the springtime when the crops are in greatest need; it is driest in summer and early autumn during the harvest seasons. East of the Wasatch Mountains the distribution is somewhat the same though thundershowers may be depended on to bring good rains in July, August and September at many stations, making these the wettest months of the year.

The average number of days with 0.01 inch or more precipitation, in the areas of the State receiving from 14 to 18 inches annually, is about 10 per month in March, April and May, which is about the same as for Iowa, and about 4 per month in June, July and August, this being about one-half the frequency in Iowa.

Fluctuations from the mean precipitation are noticeable in Utah as in any arid region, though the relative or proportional variation is not greatly different from that in such a state as Iowa. For instance, the 28-year statewide average in Utah is about 13 inches, the wettest year averaging 19 inches, or 146 per cent of the mean, and the driest year averaging 8 inches or 62 per cent of the mean; while the average in Iowa for a similar period is 32 inches, the wettest year being 44 inches, or 138 per cent of the mean, and the driest year was 20 inches, or 62 per cent of the long record mean.

Droughts or periods without rain of value to pastures or crops will endure in Utah in occasional years from 30 to 50 days, in the regions receiving around 15 inches annually, and from 60 to 90 days in regions receiving from 8 to 12 inches, though since agriculture is chiefly dependent on irrigation, and the livestock pastures in summer are on the mountain slopes where heavier precipitation is the rule, the droughts are of greatly reduced importance.

In the average year there are about 182 clear days, 97 partly cloudy days and 86 cloudy days in Utah, the number of clear days increasing considerably over the more arid portions, and decreasing somewhat over the regions receiving greater precipitation. The sunshine averages from 60% to 70% of the possible amount, indicating only

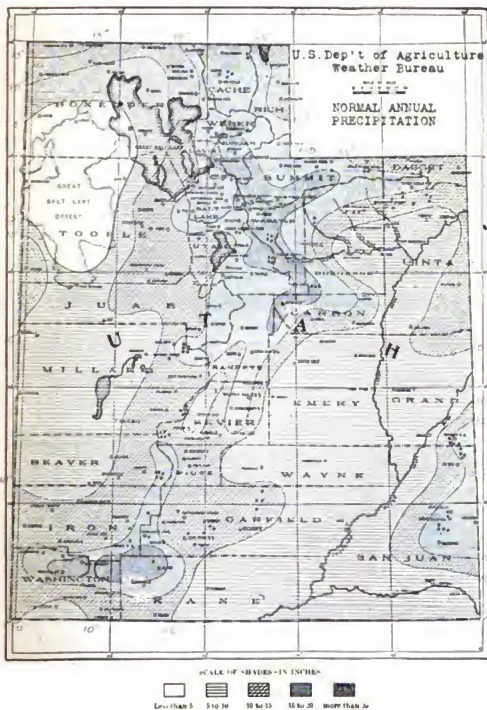
a moderate amount of sunshine as compared with definitely arid regions elsewhere.

The relative humidity at Salt Lake City averages 46% on midsummer mornings and 26% on midsummer evenings, and about 74% on midwinter mornings, and 70% on midwinter evenings. Evaporation from a water surface, as determined for a few stations along the western foot of the Wasatch Mountains, averages between 45 and 55 inches annually, about 77% of which occurs from May to September, inclusive, though these values will vary with the temperature and winds. Hail, thunderstorms, and high winds are relatively infrequent over most of the State.

Explanation of Tables.

Precipitation includes rain, and melted snow, hail and sleet. The averages and extremes are rather instable where the length of record is for only a few years. Many individual records are representative of only limited areas, owing to local topography. The interpolations necessary for determining the shadings on the accompanying chart of Normal Annual Precipitation, having been based on available precipitation records and a consideration of the vegetation, altitude and other factors. In the Killing Frost table a minimum temperature of 32 degrees (or lower) has been substituted frequently, where the actual formation of frost was not observed, due to dryness or other causes. The short record averages in this table, as in the precipitation column, are subject to rectification with the accumulation of records.

Data similar, and in addition to the tables, are available for practically all places in the United States, for comparison, on application to the Chief of the United States Weather Bureau in Washington, D. C. Detailed weather data for any station in Utah may be obtained, free, of the local office of the Weather Bureau in Salt Lake City.



UNITED STATES DEPARTMENT OF AGRICULTURE
Weather Bureau—Climatological Data for Utah

STATIONS	COUNTIES	Elevation, feet above sea level	Length of record, years	Mean annual tem- perature, Deg. F.	Mean minimum temperature Deg. F. for January	Mean Maximum temperature Deg. F. for July	Average annual precipitation in inches	Greatest annual precipitation in inches	Least annual pre- cipitation in inches	Average annual No. of days with 0.01 inch or more precipitation	Average date of first killing frost in Spring	Average date of last killing frost in Autumn	Average length of season between frosts (days)
Alpine	Utah	4900	22	54.3	17.5	94.5	17.74	29.22	11.38	51	5 Sept.	26	144
Aneth	San Juan	7600	12	43.2	10.7	73.2	23.62	32.52	12.29	52	20 Sept.	12	84
Alton	San Juan	7600	13	43.2	10.7	73.2	23.62	32.52	12.29	52	20 Sept.	12	84
Beaver	Beaver	6000	13	47.6	15.3	84.9	13.08	18.01	10.57	60	6 June	17	105
Benmore	Tooele	5500	7										
Blanding	Millard	4872	17	48.1	12.5	89.9	9.31	19.01	10.04	73	28 Sept.	14	109
Blue Creek	San Juan	6000	13	49.2	16.7	85.1	16.75	24.61	8.70	51	17 Sept.	29	135
Bluff	Box Elder	4387	27	50.9			8.18	7.43	3.68	44	5 May		
Brighton City	San Juan	4500	11				12.32	20.82	13.32	76	2 Oct.	15	166
Bonville	Box Elder	4500	11				12.32	20.82	13.32	76	2 Oct.	15	166
Canaan	Washington	5000	5	41.4	7.5	77.0	10.49	13.62	7.10	53	13 Sept.	16	95
Castle Dale	Emery	5500	20	45.9	3.0	87.5	14.71	18.29	12.69	62	4 Sept.	17	105
Castle Rock	Summit	6240	15	50.6	21.3	85.6	15.63	21.18	10.98	94	12 Oct.	2	143
Cedar City	Iron	5700	14				12.70	16.16	8.44	58	May		
Cedar Fort	Cedar	4386	4				6.56	11.50	1.61	28	May		
Clifton	Utah	4500	13	51.9	11.0	97.8	17.36	23.66	14.40	49	2 Oct.	12	163
Clarkston	Cache	5930	9				17.36	23.66	14.40	49	2 Oct.	12	163
Corinne	Box Elder	4240	49	50.4	14.8	92.8	12.46	22.35	5.41	41	May	18 Sept.	135
Coyote	Garfield		7	43.2	7.0	82.7	8.21	14.26	2.13	38	May	30 Sept.	17
Deseret	Millard	4541	24	48.8	14.0	90.9	8.28	11.33	4.85	41	May	30 Sept.	17
Duchesne	Duchesne	5515	13	43.6	3.2	85.1	9.48	11.67	7.55	61	June	3 Sept.	11
Ellerslie	Wasatch	4866	7	48.1	17.9	84.8	10.80	14.35	6.12	55	May	18 Sept.	135
Ellerslie	Utah	4556	15	50.2	17.9	84.8	10.80	14.35	6.12	55	May	18 Sept.	135
Emery	Emery	6260	18	45.6	9.7	80.8	7.93	14.33	0.94	19	June	6 Sept.	104

U. S. DEPARTMENT OF AGRICULTURE—(Continued)
Weather Bureau—Climatological Data for Utah

STATIONS	COUNTIES	Elevation, feet above sea level	Length of record, years	Mean annual tem- perature Deg. F.	Mean minimum temperature Deg.	Mean maximum temperature Deg.	F. for July	Average annual precipitation in inches	Greatest annual precipitation in inches	Least annual precipitation in inches	Average annual No. of days with 0.01 inch or more precipitation	Average date of last killing frost in Spring	Average date of first killing frost in Autumn	Average length of frost season between first and last killing frosts (days)
Kanab	Millard	8250	11	48.4	10.0	88.9	15.19	19.40	12.15	54	May	24 Sept.	19 Sept.	118
Katchikan	Box Elder	8200	29	41.9	12.5	82.0	6.53	14.48	1.46	28	May	June	14 Sept.	84
Laketown	Rich	8200	19	45.4	14.2	80.2	11.07	13.95	7.59	54	May	29 Sept.	24 Sept.	118
La Sal	San Juan	7000	17	57.7	25.6	93.1	15.04	19.23	10.33	31	April	8 Nov.	9 Nov.	215
Leeds (near)	Washington	3400	6	48.3	15.0	89.8	15.68	21.22	11.99	68	May	16 Sept.	19 Sept.	126
Lehi	Utah	4350	12	47.1	14.1	87.1	15.76	20.41	11.11	66	April	23 Oct.	14 Oct.	174
Lemay	Box Elder	4510	30	47.0	12.0	87.3	15.71	26.22	8.73	69	May	23 Sept.	30 Sept.	133
Levan	Juab	5010	30	47.0	12.0	87.3	15.71	26.22	8.73	69	May	23 Sept.	30 Sept.	133
Logan	Wayne	7000	19	42.0	6.0	85.9	6.80	13.11	3.05	35	June	11 Sept.	8 Oct.	80
Lower American Fork	Cache	4602	28	47.4	16.6	85.8	16.40	26.40	11.74	66	May	2 Oct.	7 Oct.	157
Lucin	Utah	4604	13	46.8	10.6	90.5	5.41	7.92	1.80	30	May	2 Oct.	13 Sept.	164
Lucin	Box Elder	4604	13	46.8	10.6	90.5	5.41	7.92	1.80	30	May	2 Oct.	13 Sept.	164
Lucin	Ben	4682	8	48.0	16.6	90.4	11.33	15.97	7.76	33	May	24 Sept.	18 Sept.	117
McCormick	Millard	4850	8	41.8	2.3	82.9	10.37	12.59	7.10	50	June	22 Sept.	8 Sept.	78
Manilla	Utah	6225	9	46.8	13.1	86.0	12.44	18.52	5.52	57	May	22 Sept.	20 Sept.	117
Manti	Sanpete	5575	24	46.8	13.1	86.0	20.66	22.88	16.42	84	May	26 Sept.	20 Sept.	117
Maplewood	Utah	4890	5	46.8	13.1	86.0	20.66	22.88	16.42	84	May	26 Sept.	20 Sept.	117
Marion	Summit	6750	8	45.9	14.6	85.4	20.27	26.28	12.96	99	June	10 Sept.	15 Sept.	97
Maryvale	Piute Elder	5839	18	45.9	14.6	85.4	20.27	26.28	12.96	99	June	10 Sept.	15 Sept.	97
Melville	Box Elder	4245	7	50.4	16.2	92.2	16.58	18.46	12.75	86	April	21 April	22 Nov.	272
Midway	Salt Lake	4365	7	50.4	16.2	92.2	16.58	18.46	12.75	86	April	21 April	22 Nov.	272
Midford	Beaver	4962	11	49.1	14.8	91.3	8.67	12.17	6.16	40	May	22 Sept.	12 Sept.	113
Mills	Juab	4911	7	49.1	14.8	91.3	8.67	12.17	6.16	40	May	22 Sept.	12 Sept.	113
Millville	Cache	4848	24	46.8	13.1	86.0	17.23	29.42	10.60	83	May	31 Sept.	17 Sept.	109

U. S. DEPARTMENT OF AGRICULTURE—(Continued)

Weather Bureau—Climatological Data for Utah

STATIONS	COUNTIES	Elevation, feet above sea level	Length of record, years	Mean annual tem- perature, Deg. F.	Mean minimum temperature, Deg. F. for January	Mean maximum temperature, Deg. F. for July	Average annual precipitation in inches	Least annual precipitation in inches	Average annual precipitation 0.01 inch or more	Average date of last killing frost in Spring	Average date of first killing frost in Autumn	Average length of frost, (days)
Minersville	Beaver	5070	18	50.5	17.6	90.6	10.94	16.55	56	May	12 Oct.	147
Monah	Grand	4000	29	53.7	17.1	95.4	9.33	15.49	54	April	16 Oct.	146
Modena	Iron	5479	18	47.9	15.2	89.5	11.17	23.96	54	May	26 Oct.	126
Monticello	San Juan	8800	12	42.6	10.3	85.3	20.32	44.51	54	May	26 Oct.	128
Morgan	Morgan	5500	12	47.1	10.3	85.3	20.32	44.51	54	June	16 Sept.	85
Mosada	Salt Lake	6000	11	47.1	13.5	83.9	16.14	20.72	50	May	26 Sept.	116
Mt. Pleasant	Utah	4510	7	48.6	13.4	87.6	10.89	11.65	50	May	19 Sept.	133
Mountain Home	Sanpete	5859	17	48.5	16.0	91.2	12.65	18.46	50	May	18 Sept.	132
Nada	Duchenne	6000	6				12.69	14.76	56	May		
Nephi	Beaver	5119	4				12.71	22.39	56	May		
Nephi (near)	Juab	5119	4				13.42	18.48	52	May		
New Castle	Utah	5150	6				12.43	15.01	44	May	3 Oct.	152
New Castle	Washington	5300	8				22.14	27.81	38	May		
Oak City	Millard	4000	10	51.0	17.8	90.8	14.80	19.05	10.98	May	20 Oct.	139
Ogden No. 1	Weber	4310	18	50.3	18.9	87.7	18.92	28.62	11.80	April	22 Oct.	136
Ogden No. 2	Weber	4310	50	52.2			15.92	24.81	9.31	May	1 Oct.	159
Orderville	Kane	6660	5				18.15	14.06	4.85	April	21 Oct.	113
Panguitch	Kane	6660	5	53.0	18.3	95.2	18.15	14.06	4.85	April	21 Oct.	113
Paria	Garfield	6560	11	42.0	4.5	81.9	11.05	14.93	6.59	June	15 Sept.	90
Park Valley	Salt Lake	7000	20	42.5	12.4	86.1	20.24	39.59	12.55	June	13 Sept.	97
Parowan	Box Elder	5200	8				10.19	12.76	6.82	May	28 Sept.	121
Payson	Iron	5970	29	48.5	16.6	87.0	12.89	20.87	5.04	May		
Pine Valley	Utah	4637	15				18.82	26.18	14.16			
	Washington	6000	4				20.66		5.5			

U. S. DEPARTMENT OF AGRICULTURE—(Continued)
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Pine View	Summit	6335	6				15.59	17.89	14.67	42	June	23 Sept.	9
Pinto	Washington	5907	22	44.4	13.1	84.8	14.96	25.60	7.12	52	June	23 Sept.	78
Plateau	Utah	5900	6				9.01	10.64	6.75	44	June	25 Sept.	10
Plateau (near)	Sevier	5000	5	43.5	9.5	82.4	15.19	19.64	10.46	92	June	25 Sept.	77
Price	Carbon	5566	7	47.3	4.8	87.8	13.52	17.52	11.89	60	May	25 Sept.	124
Promontory	Box Elder	4913	43	49.1	16.4	96.8	8.38	12.25	5.68	45	May	24 Sept.	123
Provo	Utah	4532	29				14.87	21.75	8.73	66	May	24 Sept.	123
Red Bluff	Utah	4442	17				10.54	13.85	7.43	57	May	24 Sept.	123
Revere	Rich	5068	8				7.49	10.49	5.73	43	May	24 Sept.	123
Richfield	Salt Lake	5350	26	48.0	13.6	89.4	13.83	15.61	13.31	72	May	30 Sept.	17
Richmond	Sevier	4529	1				22.02	32.82	1.82	38	May	30 Sept.	17
Riverdale	CACHE	4310	1				13.94	9.20	16.60	59	April	23 Oct.	4
Round Valley	Weber	5700	5	51.4	17.4	92.1	15.12	12.30	17.94	87	April	23 Oct.	4
St. George	Washington	2860	36	58.9	22.2	106.4	8.73	18.71	3.55	36	April	21 Sept.	14
Salt Lake City	Utah	4200	15	45.4	7.7	88.7	11.17	12.92	6.43	52	June	9 Sept.	14
Salt Lake	Salt Lake	4408	45	51.6	21.3	83.9	14.65	19.95	10.58	76	April	11 Oct.	22
Santaquin	Utah	5250	7	49.8	18.1	87.7	17.73	12.97	10.33	90	April	20 Oct.	19
Scipio	Millard	5260	24	47.4	12.2	88.2	14.82	21.81	6.92	72	May	25 Oct.	13
Sedfield	Carbon	7625	12	36.0	-0.8	78.7	21.89	64.26	11.99	86	June	14 Sept.	9
Silver City	Salt Lake	6127	8				13.03	13.35	7.62	57	Frost every month		
Silver Lake	Salt Lake	5800	7				34.94	46.28	29.62	103	June	10 Sept.	13
Snake Creek	Wasatch	5550	7	42.6	9.3	83.2	24.09	33.73	19.53				

U. S. DEPARTMENT OF AGRICULTURE—(Continued)

Weather Bureau—Climatological Data for Utah

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Shovelville	Box Elder	4650	26	45.5	11.2	87.9	11.82	17.04	7.92	47	June 14	Sept. 11	89
Soldier Summit	Utah	7454	16	39.0	6.2	82.1	12.04	19.20	5.58	67	Frost every month		
Spanish Fork	Utah	4585	9	50.9	18.4	88.8	17.40	20.48	14.88	73	May 5	Oct. 8	155
Springdale	Washington	3500	15	59.2	24.5	95.5	18.90	20.50	15.26	85	April 21	Oct. 26	186
Standrod	Box Elder	6000	14	44.9	17.4	79.7	13.54	19.53	11.26	89	June 1	Sept. 25	116
Sunnyside	Carbon	7600	21	43.9	12.5	78.0	14.64	19.63	9.18	61	May 24	Sept. 22	121
Terrace	Box Elder	4550	32	46.6	10.3	91.1	4.67	11.07	0.76	41	May 9	Sept. 9	91
Thistle	Utah	5033	26	46.6	10.3	91.1	15.97	24.74	7.10	57	June 9	Sept. 9	91
Thompsons	Grand	5150	6	50.6	9.4	91.7	17.55	9.19	16.05	71	May 13	Oct. 12	152
Tooele	Tooele	4900	23	49.9	20.9	88.7	14.07	16.27	12.42	83	May 21	Sept. 28	130
Tremonton	Box Elder	4775	25	47.5	14.7	86.7	15.82	21.78	12.42	36	June 6	Sept. 12	99
Tropic	Utah	4250	22	46.8	13.4	85.0	11.58	21.78	4.51	64	May 9	Oct. 13	157
Union	Salt Lake	4500	25	50.7	15.9	88.8	15.82	17.77	14.29	64	May 21	Sept. 25	126
Ute	Utah	4566	21	45.8	7.7	87.7	8.59	14.76	5.84	56	May 19	Sept. 30	124
Vernal	Utah	5250	6	45.8	8.2	85.4	6.97	9.24	5.48	27	May 19	Sept. 30	124
Victor	Utah	6210	8	45.8	8.2	85.4	11.16	13.25	9.05	71	May 19	Sept. 30	124
Watson (near)	Carbon	5540	7	45.3	6.3	88.6	4.22	13.84	2.21	25	April 16	Oct. 23	190
Wellington	Utah	5275	6	52.1	16.4	90.5	10.71	11.52	8.51	41	July 9	Aug. 18	37
Wendover	Rich	7600	14	38.7	1.7	81.6	9.90	6.92	7.89	34	May 14	Sept. 18	127
Woodruff	Utah	4500	5	48.4	3.3	91.6	6.92	7.89	5.20	34	May 14	Sept. 18	127
Woodside	Utah	4645	5	48.4	3.3	91.6	6.92	7.89	5.20	34	May 14	Sept. 18	127

The following pages contain a brief report of the factory, labor, and boiler and elevator inspections, together with a more detailed and complete report of the Mine Inspection Departments.

Salt Lake City Utah,

November 29, 1920.

The Industrial Commission of Utah,
State Capitol Building,
Salt Lake City, Utah.

Gentlemen: During the period from July 1, 1918, to June 30, 1920, there were seven hundred and sixty-five inspections of places where women and children were employed, ninety-four violations of the eight-hour day, four violations of the minimum wage law; in three of these cases back pay was collected.

SUMMARY.

Department stores, factories, canneries; in fact, every place where women and children were employed in the State, with the exception of the beet fields, orchards and farms, are included in the number of inspections noted above. Conditions surrounding employes in all industries are vastly improved; in some instances they are found to be excellent. Each year employers of women and children have come to realize that concern for the welfare of the employes makes for efficiency.

Notwithstanding the number of violations of the eight-hour law, it is generally observed by employers everywhere, and the majority of them give it their unqualified approval. Department store managers report that the efficiency of their sales people is increased under the eight-hour law, and a larger percentage of sales is had during eight hours than were formerly obtained in nine hours.

The violations noted above were special cases, and in a number of instances were due to the ambition of the girl who wanted to obtain the extra money she would receive for working overtime. In these special cases there have been threats that the incoming Legislature would be asked to repeal the eight-hour law. This would be a step backward, one which the State of Utah could hardly afford to take, as she would be the one reactionary state in all of this Inter-Mountain Region as well as the states of the Western Coast, all of which have an eight-hour law for women with the exception of Oregon, whose law states

that women be not required to work more than nine hours in one day or more than forty-eight hours in one week.

If such action should be taken by the incoming Legislature, it would be all the more regrettable for the reason that Utah led all of the Western States in welfare legislation for women. The interest of more than 12,000 women workers in the State of Utah should not be jeopardized because of a few women ambitious to earn more money, who seek to influence the incoming Legislature to repeal this splendid piece of legislation. I would rather recommend to the Legislature that they amend the law by making the women equally responsible with the employer for infractions of the eight-hour law.

I also find little disposition on the part of the employer to take advantage of the emergency clause of the law.

The minimum wage fixed by State Law is too small to warrant very many violations. During the war the minimum was lost sight of because of the scarcity of help. Women were paid the wages they demanded and needed because of the increased cost of living. However, since the war ended, some employers are now keeping strictly to the minimum, which makes it very hard, indeed, for the girls and women compelled to work for such a small pittance in view of the fact that living conditions are still high.

There is but one just way to establish a minimum wage law, and that is for the Legislature to do as other states have done, to give to the Industrial Commission the power to establish wage boards—under such a system employers and employes, alike, will receive just consideration. It is to be hoped that the incoming Legislature will do something to relieve this situation.

I am happy to report that with but few exceptions, employers and managers have been uniformly courteous to the inspector, and have assisted in every way to make the inspection required by law complete.

I would recommend an amendment to Section 3669, relative to providing seats for female help. In department stores particularly, seats should be provided for women behind the counters, where they can avail themselves of rest while momentarily disengaged. As a rule, managers object to this, as they think it does not look well to customers for a girl to be seated behind a counter. Some employers provide seats some distance from the counter, and when the girl is needed it takes some time to bring her back to the counter to wait on a customer. No woman will object to seeing a girl seated, provided the girl is

prompt to wait on her. For that reason the seats should be provided behind the counters.

As per my report of August 25, 1920, by trip to Madison, Wisconsin, where I attended the convention of the Association of Governmental Labor Officials of the United States and Canada as the representative of the Industrial Commission of Utah, was very successful. The proceedings of the convention were interesting and helpful to me, especially the remarks of Dr. John R. Commons, of the University of Wisconsin. My report of welfare and labor legislation in the State of Utah and the administration of our Industrial Commission was highly commended.

Respectfully submitted,

ZINA H. SMOOT,

Labor Inspector.

Mr. P. A. Thatcher,

Chairman, Industrial Commission of Utah,
Salt Lake City, Utah.

Dear Sir: Herewith is report of inspections made during my term from October 20, 1919, to June 30, 1920, inclusive.

The first two weeks were taken up with installing a three-way Card Index System, by which easy and quick reference is made to any firm in the state, i. e., firm names alphabetically, industries alphabetically, and inspection reports by towns alphabetically. This is a modern system and is of great assistance to the work. It is being added to each day, and we expect to have every industry in the state listed within a very short time.

There were a total of 555 inspections made by myself during this period, 456 of which were general, 45 special, 38 re-inspections, and 16 female and child labor.

The general inspection consists of a visit to the different plants and a thorough inspection made of the proper safeguarding of all machinery and dangerous places; the welfare of the employes, i. e., sanitary conditions, ventilation, light, toilet accommodations, use of goggles, proper clothing, etc., and recommendations made to the proper authority regarding same.

Upon return to the office, these recommendations are typewritten and the original copy sent to the manager of the plant with a request to notify this office when the work is completed; a duplicate copy is sent to the Industrial Commission of Utah, and a triplicate copy filed in the office.

If no response is received from the manager within a reasonable time, a follow-up letter is mailed, requesting immediate information on the subject, and sometimes a re-inspection is necessary to check up the work, and especially is this true where rebuilding has occurred or machinery been replaced or moved.

In this way a very careful record is kept of each and every plant in the state.

Of the special inspections, seven were on fatal accidents, 16 on non-fatal accidents, and the balance on miscellaneous work.

Two thousand one hundred twenty-two miles were covered by automobile, 526 miles by trains, and during the months of December and January the work was carried on

by the use of street cars on account of bad weather and roads.

These totals do not include the boiler and elevator inspections made by Mr. Spahr, whose report is submitted. We have records in the files of about 150 general and special inspections which were made previous to my employment.

Considerable time has been spent upon formulating the very important Boiler and Elevator Codes, which comprise the basic principles of the A. S. M. E. Code, with modifications suitable for this state covering existing installations, etc. The tentative drafts were submitted to and revised by committees composed of the leading boiler makers, elevator contractors, architects, building manager associations, mechanical engineers, and building inspectors of the state, who recommended their adoption. (These were adopted by this Commission on July 10, 1920, and made effective August 15, 1920.) Printed copies will be distributed to the leading factories and other places where necessary.

A factory Lighting Code is now in the process of formation, and will shortly be submitted for adoption, also rules covering the erection and maintenance of moving picture booths. These have been delayed on account of lack of time and assistance in the office, but should be issued as soon as possible, for it is one phase of protection which has been sadly neglected in many places.

There is a very common but great hazard predominating in the homes, offices and factories of this and other states, which will be impossible to control except by education, and that is the 110 and 220-volt lighting systems. Most people believe that there is no danger in handling these wires. This is true if conditions are correct, but unless one is thoroughly familiar with the conditions, it is best not to handle them. We have records in this office where three strong, healthy men have been electrocuted within the last three weeks by currents not to exceed 220 volts each, by actual test. This is appalling, and should be remedied at once. A code on the subject will obviate the defect in the factories, but publicity through the daily papers is about the only way to reach the homes. An article has already been published in this city regarding this subject, but a series of articles should be published throughout the state, where the home owner makes his own repairs instead of calling upon an electrician.

A most pleasing co-operation has been manifested by the management of the different industries, and all seem

to thoroughly appreciate the assistance we are able to give along safety lines. It is a well known fact that even a small accident has its mental effect upon all the employes of an institution, and when one occurs, the efficiency of all decreases until the accident is forgotten, thereby lessening the output. A fatal accident has been known to almost demoralize the regular system of an institution for days, and the mental attitude of the employes for a longer period. It therefore behooves the employer to take every precaution possible to avoid any accidents, no matter how trivial. Then again, the safeguarding of machinery reduces the rate of insurance and thereby saves money on the overhead expense. Some do not realize this, but the rate of insurance is based upon the hazard, and will be reduced as the hazard is reduced.

Respectfully submitted,

G. R. YEARSLEY,

Chief Factory Inspector.

REPORT OF WORK DONE**From July 1, 1919, to July 1, 1920**

The Industrial Commission of Utah,

Gentlemen: In reporting the work done in this department I cannot be either as comprehensive nor as accurate as I should like to be, owing to fact that about the last week of September, 1919, I was informed that no further weekly reports would be required of my work, and no specific account of all of my work has been kept since. At this time I was called out of the city so often and on a variety of work that it was practically impossible to keep an accurate account of my activities.

It occurred quite frequently that in going to outside work, that I had to inspect boilers, elevators, industrial risks and mercantile risks and classifications, and I have not been able to properly segregate time consumed, and particulars of each and every survey that I have made. I, too, am called out quite often to give instructions where material changes are in progress on boilers and elevators, also to pass on alterations in new installations. Another matter that has taken up considerable time at intervals is this, that owing to the fact that I am charged with boiler, elevator, fund, and industrial inspections, I have never felt safe in making appointments a week or so ahead for boilers, so that they can be properly cooled and cleaned. It is absolutely essential that from a week to ten days notice be given to have boilers ready for inspection. This I could not do as I never knew how soon or when I would be called to make a different survey anywhere in the state, and be unable to keep dates made to have boilers ready.

Elevators have been attended to when nothing else was pressing, and am pleased to report that with one or two exceptions, we are having good success in having safeguarding done, and the machines I have had time to inspect since new code became effective are gradually being brought up to comply with code by their owners or lessees. The adoption of the A. S. M. E. Boiler Code and new Elevator Code has increased office work, at least doubled it, and now more time is needed in office to care for correspondence, checking inspectors' reports, filing and keeping records.

It is up to this department to get a line on all uninsured boilers and inspectors' reports from all boiler insurance companies doing business in the State, and as soon as we can get the serial numbers to them we are in a fair way to get age, condition, and history of every insured boiler in the state.

It is up to this department to get a line on all uninsured boilers, but I am convinced that no one man can do it, unless it will be made his sole business, and even then I have grave doubts that any one man can do justice to the Commission, the job, or himself.

From July 1, 1919, to October 1, 1919, I made 119 boiler inspections, 49 elevator, 10 mercantile and 8 industrial surveys, and investigated a number of accidents. From October 1, 1919, to July 1, 1920, I can only give an estimate of the number of surveys made, but in addition to my common ordinary duties, the boiler and elevator regulations were being compiled and put in workable shape, and considerable time was used up in compiling, conferences with boilermakers, elevator contractors, insurance and safety men, and insurance inspectors, revising and proof reading.

From October 1, 1919, to July 1, 1920, a conservative estimate of inspections made is thirty per month, or 270 inspections, all told, for the period named above. These surveys covered boilers, elevators, industrial investigations of accidents, and mercantile inspections, and follow-up surveys, of which no record is kept, unless something extraordinary develops, as for instance, defiance of our authority to require betterments to be made or neglect to follow our recommendations.

This, I believe, is the best report of the work of this department I can give, and I regret very much that I cannot give a more specific report for the time between October 1, 1919, and July 1, 1920. I know that the estimate of work done is below the actual, but would rather have it so, than give you an account that would not accord with the facts.

TO SUMMARIZE.

Actual number of inspections made when strict account was kept:

Boilers	119
Elevators	69
Mercantile	20
Industrial	8
<hr/>	
Total	216
Estimated at 30 per month since October 1, 1919.....	270
<hr/>	
Making a Grand Total.....	486
for the year ending July 1, 1920.	

In this period I found it my duty to condemn five boilers and two elevators that had outlived their usefulness, and been called on a number of time for advice and instructions on both new and existing installations.

Respectfully submitted,

GEO. B. SPAHR,

Boiler and Elevator Inspector.

**SERIAL NUMBERS FOR BOILER INSURANCE
COMPANIES IN THE STATE OF UTAH**

Utah	1 to 500-U
Maryland Casualty Company.....	501 to 1000-MC
Ocean Accident & Guarantee.....	1001 to 1500-OAG
Hartford Insurance Co.....	1501 to 2200-H
Royal Indemnity Co.....	2201 to 2600-RI

Copy mailed to every boiler insurance company doing
business in the state.

REPORT
OF THE
MINE INSPECTION
DEPARTMENT

TO THE
Industrial Commission of Utah

Mine Inspection Department

C. A. Allen, Chief of the Department,
Mining Engineer, U. S. Bureau of Mines.
John Crawford, Coal Mine Inspector.
Wm. E. Harrison, Metal Mine Inspector.
Mrs. Viola De Hon, Secretary to the Department.
Miss Thelma Lubeck, Typist.

In presenting to the Industrial Commission a report of the work of the Mine Inspection Department, mention should first be made of the co-operative arrangements whereby the department assisted and was assisted by other State and Government bureaus in certain phases of the work of preventing accidents and gathering statistics regarding the mineral industry of Utah.

The first of these agreements between the Commission and the U. S. Bureau of Mines, whereby an engineer of the Bureau was made the Chief of the Mine Inspection Department, has resulted in the experience and advice of the Bureau of Mines staff of experts being made available to the work in this State, and also made available to the State the laboratories and considerable of the equipment of the Federal Bureau. In return, the State has made available to the Government all experience gathered by the Inspection Department, and further benefit accrues in that the accident and labor data is gathered from the operators by the State and furnished to the Bureau of Mines, making figures more reliable and eliminating duplication on the part of the operators.

The second agreement was between the Industrial Commission and the U. S. Geological Survey, whereby the production figures of the coal mines are gathered only by the Geological Survey and copies furnished to the Commission.

The third arrangement was entered into with the U. S. Bureau of Census, whereby the labor data gathered by the Census for the year 1919 was made available to the State and also to the Bureau of Mines.

The object of these agreements was to prevent the duplication of effort and expense, as between different state and governmental agencies, and to eliminate any duplication in making out reports by mine operators. Not only has considerable expense been avoided but closer and more friendly co-operation has been secured.

The work of the Mine Inspection Department, as it has been carried on during the last two years, can be briefly summarized as follows:

1. The answering of inquiries regarding the mineral resources of Utah.
2. Inspection of metal mines.
 - (a) General inspection for safety.
 - (b) Inspection of fatalities.
 - (c) Preparation of metal mine safety orders.

- (d) Analysis of accident and labor data.
- 3. Inspection of coal mines.
 - (a) General inspection of the mines.
 - (b) Inspection of fatal accidents.
 - (c) Preparation of coal mine safety orders.
 - (d) Analysis of production, labor, and accident data.
- 4. Inspection of mills and smelters.
- 5. Inspection of quarries.
- 6. Welfare work among employees.
 - (a) Co-operation with mine rescue car.
 - (b) Publication of Utah Safety Record.

Inquiries Regarding the Mineral Industry of Utah.

There have been a very large number of inquiries received by this department regarding the mineral resources and the condition of the industry in Utah. Most of these have been answered direct, but a number have been referred to Professor Wm. Peterson, the State Geologist. Due to the fact that the State has never had a geologist until within the past two years, and during that time all his energies have been spent on valuation work, most of the data that has been published regarding the State's resources has been published by the U. S. Geological Survey.

Taking into consideration the variety and extent of undeveloped resources, Utah equals, if it does not exceed, any other state in the Union, and it is not out of place to suggest that funds should be provided for the State Geologist to gather further detailed information that could be given out to those making inquiries. A great deal of this information could be much better furnished by a geological and mineralogical department than by the Inspection Department. In order, however, that this report may serve as a guide to those desiring information regarding the State, the following data is given:

Precious Metal Mines.

The following list of the metal mines of Utah, which are now active, will give an idea of this industry in the State. It will be noted that most of the metal mining is confined to the three camps surrounding Bingham, Eureka and Park City. Outside of these camps, Ophir and Vipont are the two largest in point of production. The most important developments during the period covered by this report were in the district east of the town of Eureka, which is known

as the "East Tintic District," and at the Vipont mine in the extreme northwestern corner of the State.

In East Tintic the Tintic Standard Mine, which had been under development for a number of years under most discouraging conditions, encountered, a few years ago, a large and very valuable body of ore which caused great interest to be taken in this district. A large number of claims in a strip several miles long and a mile wide were grouped into a number of different holdings and development work started. Due to the fact that the Tintic Standard ore body was found at about 1200-foot depth, most of the other companies planned on sinking shafts from 500 to 1200 feet deep. At one time there were 15 different shafts being sunk in this district and most of this work is still being prosecuted. It is a credit to the State of Utah that a great deal of this work has been done with money furnished by the citizens of the State, and, for the most part, the promotions have been clean and legitimate.

Unfortunately, none of the new companies have, as yet, uncovered any large deposits of ore comparable with that of the Tintic Standard Mine, and this is probably not due to the fact that all the country is barren but due to the difficulty of locating those places favorable to ore deposition. The geology of the district is somewhat complex and the need of a general study to correlate the evidence from all the properties is sorely needed. Practically all of the new openings have been made since any detailed geological study of the district was made and certainly another investigation at the present time would be of inestimable benefit to the operators.

At the Vipont Mine, in northwestern Utah, a large body of low grade silver ore has been known for a good many years and during 1919 the property was taken under option by interests closely allied with the Utah Consolidated Mining Company at Bingham. Under this new company, the mine has been intelligently developed and a concentration and flotation plant installed. Over 100 men are employed and the activities have been of great benefit to the community which was previously an isolated district with scattered farms in the surrounding valleys. The Vipont district is located 28 miles from the nearest railroad at Oakley, Idaho.

On the whole, the metal mines of Utah are at present struggling under many adverse conditions. The majority of the mines, which have furnished the bulk of the production of precious metals in the past, are finding it increasingly difficult to locate new ore bodies to replace those

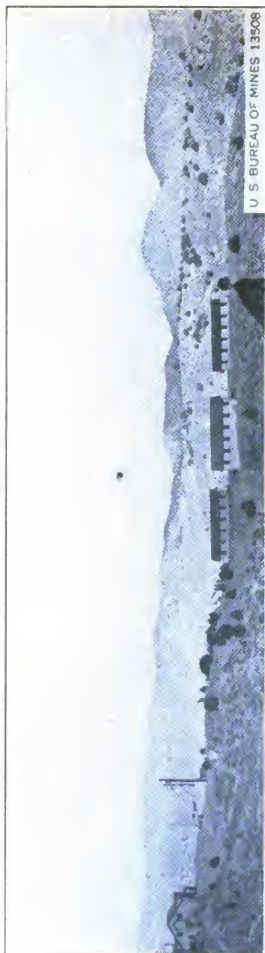
which are rapidly being exhausted. Labor has been scarce, and while there are still a large percentage of high class trained miners, there have been many "floaters" employed in the mines who are neither efficient nor dependable. The large percentage of these men has served to reduce the total efficiency of the labor to a very serious degree. After the war, metal prices dropped, but there was no corresponding decrease in wages nor the prices of commodities, and, recently, the high prices paid at the coal mines have drawn a number of men from the metal mines. These conditions, taken together with the increased taxes of various kinds, have made metal mining a rather discouraging undertaking. A study of the accompanying tables shows how these conditions are reflected in the fewer number of men employed and decreased production.

The general public must realize that, with the exception of copper, it is difficult to see where the deposits of the other precious metals are to be found, with which to supply the future demands of the world. There are undoubtedly many large ore bodies still undiscovered, but to locate them will require expensive explorations, with consequently increased chances of serious financial loss. State legislatures, especially, should take cognizance of this condition and not further discourage capital from going into mining by imposing any hardships in the way of taxes that can legitimately be avoided.

Within the past year, there have been issued two excellent publications which are available, without cost, to anyone desiring additional and definite information regarding the mineral deposits. These are:

Bulletin No. 12 of the University of Utah, entitled, "The Mineral Industry of Utah," by Robert S. Lewis, of the University, and Thomas N. Varley, of the U. S. Bureau of Mines, which can be secured from the University of Utah, Salt Lake City.

The other paper is Professional Paper No. 111, of the U. S. Geological Survey, entitled, "The Ore Deposits of Utah," which can be secured from the Director of the U. S. Geological Survey, Washington, D. C.



View of No. 2 Shaft, Tintic Standard Mine, Showing Topography of East Tintic District

UTAH MINING COMPANIES

(Not including coal mines)

Names in parenthesis indicate district or town
where mine is located.

Apex Standard Mining Co., 609 Newhouse Bldg., City. (East Tintic)	Gemini Mining Co., Inc., 723 Kearns Bldg., City. (Eureka)
Austin Mining Co., 1022 Boston Bldg., City.	Grater Con. Mines Co., 201 Ness Bldg., City. (Big Cottonwood)
American Con. Mines Co., 323 Judge Bldg., City. (Cottonwood)	Grand Central Mining Co., Provo, Utah. (Mammoth)
Bullion-Beck & Champ. Mg. Co., 416 Newhouse Bldg., City. . (Eureka)	Globe Con. Mining Co., 420 Boston Bldg., City. (American Fork Canyon)
Bingham Conger Copper Co., 306 Kearns Bldg., City. (Bingham)	General Eng. Co., 159 Pierpont Street, City. (Salt Lake City)
Beaver Copper Co., 609 Newhouse Bldg., City. (Beaver County)	Howell Mining Co., 209 Felt Bldg., City. (Big Cottonwood Canyon)
Michael Barnett, Marysville, Utah.	Mr. Ernest R. Higginson, Lessee, Silver City, Utah. (Sun Beam Mine)
Cardiff Mining & Milling Co., Newhouse Bldg., City. (Big Cottonwood)	Iron King Con. Mining Co., Box 267, Provo, Utah. (East Tintic District)
Coin Silver Mines Co., 411 Dooly Bldg., City.	Iowa Copper Mining Co., Park City, Utah. (Big Cottonwood)
Deer Trail Mining Co., 321 Felt Bldg., City. (Marysville)	Independence Mining Co., Eureka, Utah. (East Tintic)
Eureka Mines Co., 723 Kearns Bldg., City. (Eureka)	Idaho-Utah Mining Co., Oakley, Idaho. (Box Elder)
Eureka Hill Mining Co., 9th East and 1st South St., City. (Eureka)	Keystone Development Co., 1116 Newhouse Bldg., City. (Stockton)
Godiva Mining Co., 723 Kearns Bldg., City. (Eureka)	Mr. D. W. Lynch & L. L. Travis, Gisborn, Utah.

UTAH MINING COMPANIES—(Continued)

Louise Mining Co., 407 Deseret Bank Bldg., City. (Alta)	Tintic Standard Mining Co., 422 Judge Bldg., City. (East Tintic)
Lehi Tintic Mining Co., Boston Bldg., City. (N. E. Tintic)	Tushar Range Metals Mining Co., Marysvale, Utah. (Marysvale)
E. J. Longyear, Eureka, Utah.	Tecoma Con. Mining Co., 1407 Walker Bank Bldg., City. (Near Tecoma, Nevada)
Mineral Products Corp., Marysvale, Utah.	Union Assay Co., 152 South West Temple, City.
North Beck Mining Co., 422 Judge Bldg., City. (Eureka)	Utah Zinc Co., 525 Newhouse Bldg., City. (Near Tecoma)
New Stockton Mining Co., 1116 Newhouse Bldg., City. (Stockton)	Uncle Sam Con. Mining Co., 515 Dooly Bldg., City. (Near Tecoma)
Price Mining Co. Utah Sav. & Tr. Bldg., City. (Big Cottonwood)	Vipont Silver Mining Company, 608 Dooly Bldg., City. (Box Elder)
Ridge & Valley Mining Co., 723 Kearns Bldg., City. (Eureka)	Victoria Gold Mining Co., 422 Judge Bldg., City. (Eureka)
Ramshore Mines Co., 321 Felt Bldg., City.	Wasatch Mines Co., 713 Judge Bldg., City. (Alta)
South Standard Mining Co., 422 Judge Bldg., City. (East Tintic)	Zuma Mining & Milling Co., Eureka, Utah. (Eureka)
Stockton Standard Mining Co., 523 Atlas Bldg., City. (Stockton)	American Smelting and Refining Co., 714 McCornick Block, City.
Silver Shield Mining & Milling Co., Bingham, Utah. (Bingham)	Big Indian Copper Co., Provo, Utah. (Southern Utah)
Silver Reef Con. Mines Co., 1110 Newhouse Bldg., City. (Cedar City Country)	Daly Mining Co., 1003 Boston Bldg., City. (Park City)
Lakeview Mining Co., 418 Eccles Bldg., Ogden, Utah.	Garfield Smelting Co., 714 McCornick Block, City. (Garfield)

UTAH MINING COMPANIES—(Continued) (Not including coal mines)

Gold Chain Mining Co., Provo, Utah. (Mammoth)	Crismon & Nichols, 229 So. West Temple St., City. (Assayers)
International Smelting Co., Cashier, Tooele, Utah. (Tooele)	Eureka Lily Mining Co., Judge Bldg., City. (East Tintic)
Mammoth Mining Co., 409 Hooper Bldg., City. (Mammoth)	Eagle & Blue Bell Mining Co., 404 Dooly Bldg., City. (Eureka)
Niagara Mining Co., U. S. S. R. Co., Newhouse Bldg., City. (Bingham Canyon)	Emma Silver Mines Co., 515 Dooly Bldg., City. (Alta)
Ophir Hill Con. Mining Co., Ophir, Utah. (Ophir)	Mr. D. P. Fenkell, Scranton, Utah. (Scranton)
Silver King Coalition Mining Co., 1008 Kearns Bldg., City. (Park City)	H. B. Hullinger & F. Marzoli, Ophir, Utah.
Utah Copper Co., 600 McCormick Bldg., City. (Bingham)	G. A. Hokanson, et al, On premises of the Ontario Silver Mining Co., Summit County, Utah.
U. S. Smelting Co., Newhouse Bldg., City. (Midvale)	A. L. Inglesby, et al, Bingham, Utah.
Utah Con. Mining Co., Dooly Bldg., City. (Bingham)	Liberty Development Co., Bingham, Utah.
Annie Laurie Gold Mines, Care of Salt Lake Hardware, City. (Marysvale District)	Majestic Copper M. & S. Co., Milford, Utah. (Near Milford)
Bingham Mines Co., Dooly Block, City. (Eureka and Lark)	Milford Copper Co., Newhouse Bldg., City. (Near Milford)
Peter B. & Robt. Bradley, 92 State St., Boston, Mass.	Mr. Earl L. McIntyre, Mammoth, Utah. (Supt. Mammoth Mines)
Bullion Coalition Mines, Dooly Block, City. (Stockton)	Morgan Chief Mining Co., Morgan, Utah. (Near Peterson)
Bonneville Development Co., 413 Dooly Block, City. (Provo)	Ophir Coalition Mines Co., Care of Mark Hopkins, Cullen Hotel, City. (Ophir)

UTAH MINING COMPANIES—(Continued) (Not including coal mines)

Ontario Silver Mining Co., 161 South Main St., City. (Park City)	Messrs. Berolatti Brothers, Stockton, Utah.
Quad Metals Mines Co., Salt Lake City, Utah. (Frisco)	Buena Vista Co., Big Indian Via Moab, San Juan Co., Utah.
Salt Lake Copper Co., Walker Bank Bldg., Salt Lake City, Utah. (Near Tecoma, Nevada)	Babcock Mining Co., Calleo, Utah.
St. Croix Con. Mining Co., Star Mining District, (12 miles southwest of Milford, Utah)	Bingham Empire Mines Co., Care of Knight Investment Co., Provo, Utah. (Bingham District)
Grant Snyder, 414 Judge Bldg., City.	Chief Con. Mining Co., 822 Newhouse Bldg., City. (Eureka)
Union Chief Mining Co., 515 Newhouse Bldg., City. (Santaquin)	Colorado Con. Mines Co., Provo, Utah. (Eureka)
Utah Silver Lead Mines Co., Walker Bank Bldg., City. (Box Elder Co.)	Cottonwood Metals Mines Co., 503 U. S. & Trust Bldg, City. (Big Cottonwood)
The Woodman Mining Co., Gold Hill, Tooele Co., Utah. (Near Gold Hill)	Creole Copper Mines, 525 Atlas Bldg., City. (Big Cottonwood)
Yosemite Mines Co., City. (Bingham)	Copper Leaf Mining & Milling Co., Eureka, Utah. (East Tintic)
Scranton Leasing Co., Scranton, Utah.	Mr. C. C. Crismon, 229 South West Temple St., City.
Alta Tunnel & Transportation Co., Newhouse Bldg., City. (Big Cottonwood)	Dragon Cons. Mining Co., Care of Knight Investment Co., Provo, Utah. (Silver City)
Alta-Michigan Mines Co., 161 Main St., City. (Alta)	Mr. E. F. Birch, Assistant Manager, Knight Investment Co., Silver City, Utah.
Albion Mining Co., 135 Main St., City. (Alta)	Big Hill Mining Co., Care Knight Investment Co., Provo, Utah. (East Tintic)
American Leasing Co., Tying P. O., American Fork C., Utah. (American Fork)	Boston-Acme Mines, Morgan, Utah.

UTAH MINING COMPANIES—(Continued) **(Not including coal mines)**

Columbus Rexall Con, Mines Co., Care Columbia Trust Co., City. (Alta)	North Standard Mining Co., 520 Judge Bldg., City. (N. E. Tintic)
Central Standard Mining Co., Eureka, Utah. (East Tintic)	Ohio Copper Co. & Bingham C. Ry., Lark, Utah. (Bingham Canyon)
Daly West Mining Co., Deseret Bank Bldg., City. (Park City)	Park Utah Mining Co., Judge Mining Co., City. (Park City)
Empire Mines Co., Care Knight Investment Co., Provo, Utah. (Mammoth)	Pinion Queen Mining Co., 422 Judge Bldg., City. (East Tintic)
Walter Fitch, Contractor, Eureka, Utah.	Stimpson Equipment Co., Felt Bldg., City.
General Reduction & Chemical Co., 23 West 2nd South, City.	Tar Baby Mining Co., South Fork, Big Cottonwood Canyon, Salt Lake County, Utah. (Big Cottonwood)
Griggs-Huish Leasing Co., Eureka, Utah. (Eureka)	Tintic Central Mining Co., Care R. L. Anderberg, Knight Investment Co., Provo, Utah. (Tintic District)
Iron Blossom Con. Mining Co., Care Knight Investment Co., Provo, Utah.	Tintic Milling Co., Care Knight Investment Co., Provo, Utah. (Silver City)
Judge Mining & Smelting Co., Deseret Bank Bldg., City. (Park City)	Tintic Drain Tunnel Co., Care Knight Investment Co., Provo, Utah. (Tintic and Silver City)
Knight Investment Co., Provo, Utah. General Mining, etc.	Utah Leasing Co., Newhouse Bldg., City. Absolute.
Knox & Co., P. O. Box 143, Midvale, Utah. (Midvale)	Sharp Lead Co., Inc., 421 Judge Bldg., City.
May Day Mining & Milling Co., Dooly Block, City. (Eureka)	Guy Sterling, Newhouse Bldg., City.
Michigan Utah Con. Mines Co., Felt Bldg., City. (Alta)	Wasatch Range M. & M. Co., American Fork, Utah.
New Quincy Mining Co., 202 Atlas Block, City. (Park City)	

UTAH MINING COMPANIES—(Continued) (Not including coal mines)

American Chemical & Ozokerite Co., Soldier Summit, U'ah.	Nail Driver Mining Co., 163 South Main St., City. (Park City)
American Chemical & Ozokerite Co., 1801-5 Wabash Ave., Chicago, Ill.	John Sanberg & Max Krotki, Marysvale, Utah.
Alta Cons. Mining Co., 335 South Main St., City. (Alta)	Sylvester Brothers, Knightsville, Utah.
Messrs. J. W. Currie & Co., 70 West 3rd South St., City.	Tintic Paymaster Mines Co., Eureka, Utah. (N. E. Tintic)
G. T. Christison, Eureka, Utah.	West Toledo Mines Co., 210 Judge Bldg., City. (Alta)
Crown Point Cons. Mining Co., Juab and Utah Counties. Provo, Utah. (Eureka)	Woodlawn Copper Mining Co., 134 North Main St., City. (Alta-Cottonwood)
Mr. Elmer Duncan, Eureka, Utah.	Western Utah Copper Co., 606 Newhouse Bldg., City. (Gold Hill)
East Tintic Coalition Co., Provo, Utah. (East Tintic)	Eastern Iron & Metal Co., 353 West 7th South St., City.
Eureka Tintic Coalition Co., Provo, Utah. (Tintic District)	Mr. E. M. Hardy, Midway, Utah.
Harry Gardner, 134 North Main St., City.	Peruvian Cons. Mining Co., 809 South 9th East St., City. (Alta)
Greeley M. & M. Co., Provo, Utah. (N. E. Tintic)	M. J. Dailey, Lessee, 1008 Kearns Bldg., City.
Mr. W. Marion Johnson, Silver City, Utah.	Eureka Bullion Mining Co., Provo, Utah. (East Tintic)
Keystone Mining Co., 163 South Main St., City. (Park City)	Florence Mining & Milling Co., Marysvale, Utah.
Mt Nebo Cons. Mining Co., 403 Utah Savings & Trust Bldg., City. (Santaquin District)	Horn Silver Mines Co., Frisco, Utah. (Frisco)
	Imperial Lead Mining Co., Care W. Mont Ferry, City. (West of Eureka)
	Jackson Leasing Co., Park City, Utah.

UTAH MINING COMPANIES—(Continued) (Not including coal mines)

A. O. Johnson & J. J. Cronin, Silver City, Utah.	Parowan Co-operative M. & M. Co., Parowan, Utah.
Mr. Thomas Kearns, Kearns Bldg., City.	Paloma Gold & Silver Mining Co., 631 Judge Bldg., City. (Near Milford)
Keno Mining & Milling Co., Care Knight Investment Co., Provo, Utah.	Pioneer Leasing Co., 310 Judge Bldg., City.
Keystone Metals Reduction Co., Farmers Bank Bldg., Pittsburgh, Pa.	Red Warrior Mining Co., Duluth, Minn. (Near Milford)
A. W. Larson Leasing Co., P. O. Box 181, Eureka, Utah.	Verner Z. Reed & James Doyle, 1020 First Natl. Bank Bldg., Denver, Colorado.
Lakeview Lead & Silver Mining Co., 18-20 East 1st South St., City. (Promontory Point)	Mr. Wm. B. Ridgely, Boyd Park Bldg., City.
E. J. Longyear, 1265 East 1st South St., City.	Sells Mining Co., 201 Judge Bldg., City. (Alta)
George Merrill Co., Newhouse Bldg., City.	South Hecla Extension Mining Co., 161 South Main St., City. (Alta)
Albion Con. Mining Co., Care Knight Investment Co., Provo, Utah. (Alta.)	South Hecla Extension Mining Co., 161 South Main St., City. (Alta)
Miller Hill Mining Co., Care Knight Investment Co., Provo, Utah. (American Fork Canyon)	South Utah Mines & Smelters, Newhouse, Utah.
Nephi McKee, Knightsville, via Eureka, Utah.	Silver King Cons. Mining Co., Newhouse Bldg., City. (Park City)
Milford Magnolia Mines, Milford, Utah. (Near Milford)	John Stormberg, Eureka, Utah.
O. K. Silver Mining & Milling Co., 611 Kearns Bldg., City. (Tooele County Near Tintic Junction)	Sioux Mines Co., Care Knight Investment Co., Provo, Utah. (Eureka)
Old Scotia Mining Company, 914 Boston Bldg., City.	Triangle Mining Co., Alta, Utah.
The Ore Products Corp., Green River, Utah.	Three Kings Con. Mining Co., Newhouse Bldg., City. (Park City)

UTAH MINING COMPANIES—(Continued) (Not including coal mines)

Tintic Delmar Mining Co., Room 1, Knight Block, Provo Utah. (Tintic District)	Minerals Separation N. Amer., Corner 61 Broadway, New York City, New York.
The Southern Utah Mining Co., St. George, Utah.	Needles Mining Company, 343 South Main St., City.
The Utah Mines, 402 Kearns Bldg., City. (Fish Springs)	Raven Mining Co., of Utah, Cor. Broadway and Adams St., Chicago, Ill.
Utah Revenue Mines Co., 503 Boyd Parks Bldg., City.	Utah-Apex Mining Co., Bingham, Utah. (Bingham)
Utah Metal & Tunnel Co., 611 Walker Bank Bldg., City. (Bingham)	Utah Ore Sampling Co., 820 Newhouse Bldg., City. (Midvale)
Utah Natural Products Co., Boston Bldg., City.	Apex Standard Mining Co., 609 Newhouse Bldg., City. (East Tintic)
Utah Boston Development Co., 702 Walker Bank Bldg., City.	Black & Deason, Inc., 165 South West Temple St., City.
Messrs. Wilson Brothers, 209 Brooks Arcade, City.	Capitol Mining Co., 202 Atlas Bldg., City. (Near Milford)
B. Wheelock & E. G. Jensen, Mammoth, Utah.	Garrison-Monster Mining Co., Gold Hill, Utah. (Gold Hill)
West Mercur Mines Co., 11 Broadway, New York City.	Humboldt Mining Co., 202 Atlas Block, City. (Star Mining District, 5 miles southwest of Milford, Utah)
Whimpey & Paxman, Silver City, Utah.	Montana-Bingham Cons. Mining Co., Inc., Dooly Block, City. (Bingham)
The New York Mining Co., 730 Symes Bldg., Denver, Colorado.	Ophir Metal Co., 1609 Walker Bank Bldg., City. (Ophir)
Zalinski & Hilsdale, 308 Kearns Bldg., Salt Lake City, Utah.	Wm. F. Peters & Sons, 1609 Walker Bank Bldg., City.
Caffey & Glaser, Beaver, Utah.	Lear E. Riter, Care Tintic Mercantile Co., Eureka, Utah.
J. F. Gibbs, Duquesne Exploration Synd. Co., Marysville, Utah.	
East Crown Point Mining Co., 427 Ness Bldg., City. (East Tintic)	

UTAH MINING COMPANIES—(Continued)
(Not including coal mines)

Western Utah Extension Co., 313 Walker Bank Bldg., City. (Gold Hill)	American Con. Mining Co., 3 Exchange Bldg. (American Fork)
Republic Development Co., Calleo, Utah. (Near Calleo)	South Park Mining & Develop- ment Co., Desert Bank Bldg., City. (American Fork)
Syndicate Mining Co., B. H. Bullock, Provo, Utah. (Near Payson)	Leonora Mining Co., 135 East 3rd South St., City. (Near Milford)
Payson Eldorado, R. A. Porter, President, Payson, Utah.	Utah Sulphur Corp., Deseret Bank Bldg., City. (Morrissey)
Pacific Gold Mining & Milling Co., American Fork. (American Fork Canyon)	Southern Pacific Gold & Copper Co., 1306 Walker Bank Bldg., City. (North of Ogden)

UTAH'S SMELTERS

Name of Company	Location of Plant	Kind of Smelter
American Smelting & Refining Co.	Murray	Lead
Garfield Smelting Co.	Garfield	Copper
International Smelting Co.	Tooele	Copper and Lead
Judge Mining & Smelting Co.	Park City	Electrolytic Zinc
U. S. Smelting, R. & M. Co.	Midvale	Lead
Utah Zinc Co.	Murray	Zinc

UTAH'S ORE DRESSING PLANTS

Name of Company	Location of Plant	Type of Plant
Chas. Moore	Park City	Concentration
Chief Consolidated Mining Co.	Eureka	Concentration
Deer Trail Mining Co.	Marysvale	Cyanide
Glen Allen Mining Co.	Park City	Special
Griggs-Huish Leasing Co.	Eureka	Special
Horn Silver Mines Co.	Frisco	Concentration
Judge Mining & Smelting Co.	Park City	Concentration
The Knox Company	Midvale	Concentration
Mineral Products Corporation	Marysvale	Lixiviation
Ophir Hill Cons. Mining Co.	Ophir	Concentration
Quad Metals Co.	Frisco	Concentration
Silver King Coalition Mining Co.	Park City	Concentration
Tintic Milling Co.	Silver City	Special
Tintic Standard Mining Co.	Goshen	Special
U. S. Smelting, R. & M. Co.	Midvale	Concentration
Utah-Apex Mining Co.	Bingham	Concentration
Utah Consolidated M. & M. Co.	Tooele	Concentration
Utah Copper Co.	Arthur	Concentration
Utah Copper Co.	Magna	Concentration
Utah Ore Sampling Co.	Murray	Testing
Vipont Silver Mining Co.	Vipont	Concentration
Western Utah Copper Co.	Gold Hill	Concentration

Mine Production of Gold, Silver, Copper, Lead and Zinc in Utah in 1919, by Counties.
(Advance Figures by V. C. Heikes, U. S. Geological Survey.)

COUNTY	Number of Producers	Ore Treated, Short Tons	Gold Fine Ounces	Silver Fine Ounces	Copper Pounds	Lead Pounds	Recoverable Zinc, Pounds	Total Value
Beaver	20	82,115	1,447.23	290,109	538,585	4,897,083	44,268	\$ 717,793
Box Elder	5	2,009	47.02	10,087	210,696	256,729	35,666	67,653
Juab	38	233,297	23,953.03	4,822,227	2,660,704	17,799,667	93,571	7,322,551
Millard	1	4	2.23					46
Morgan	1	59		223		24,035		1,524
Piute	6	16,509	5,167.37	130,870	21,841	410,391		280,806
Salt Lake	52	6,111,772	67,703.57	1,937,006	117,625,126	59,745,530	2,679,608	28,802,101
Summit	9	100,359	2,897.90	1,533,588	483,476	14,317,841	16,796	2,627,523
Tooele	30	87,339	775.55	520,169	1,512,157	12,311,435	398,355	1,561,469
Utah	13	64,281	2,005.29	1,993,381	694,144	7,042,877		2,776,424
Wasatch	2	47,491	464.25	412,082	277,382	6,993,443	1,262,760	965,655
Washington	2	278	.97	210	137,786			25,883
Total, 1919	179	67,455,423	101,464.41	11,649,961	124,061,807	123,829,051	4,431,024	\$ 45,169,828
Total, 1918	251	14,705,718	142,666.10	13,155,597	227,169,630	167,008,224	18,399,417	† 86,047,597
Total, 1917	334	15,358,481	162,305.67	13,197,133	246,674,153	178,521,958	21,286,871	† 99,328,155
Total, 1916	318	13,920,643	172,335.06	13,253,037	240,215,222	201,490,075	29,572,328	† 89,268,684

* Average value of metals in 1919: Gold, \$20.6718 per ounce; silver, \$1.12 per ounce; copper, \$0.181 per pound; lead, \$0.053 per pound; zinc, \$0.073 per pound.

† Average value of metals in 1918: Gold, \$20.6718 per ounce; silver, \$1.00 per ounce; copper, \$0.247 per pound; lead, \$0.071 per pound; zinc, \$0.091 per pound.

‡ Average value of metals in 1917: Gold, \$20.6718 per ounce; silver, \$0.814 per ounce; copper, \$0.273 per pound; lead, \$0.086 per pound; zinc, \$0.102 per pound.

LABOR DATA

MINES OF UTAH OTHER THAN COAL MINES

	1916	1917	1918	1919
Average days worked per man	318	326	340	325
Average number of men employed—				
Underground..	4,690	5,079	4,165	3,057
Open Pit	1,500	1,626	1,437	782
Surface	1,194	1,228	1,299	760
Total	7,384	7,933	6,901	4,599
Total day's labor—				
Underground..	1,445,661	1,626,780	1,403,926	977,780
Open Pit	547,500	588,410	518,659	278,990
Surface	351,846	370,846	425,048	240,653
Total	2,345,007	2,586,036	2,347,633	1,497,423

LABOR DATA

ORE DRESSING PLANTS AND SMELTERS OF UTAH

Ore Dressing Plants.

	1916	1917	1918	1919
Men employed....	3,017	4,103	1,942	1,382
Days of labor.....	1,073,745	1,459,383	691,255	483,852
Average days active	356	356	356	357

Smelters.

	1916	1917	1918	1919
Men employed....	2,401	2,658	3,173	1,832
Days of labor.....	878,426	952,918	1,158,145	667,450
Average days active	365	359	365	365

Auxiliary Works.

	1916	1917	1918	1919
Men employed....	857	1,811	1,885	709
Days of labor.....	310,352	657,387	681,762	258,652
Average days active	362	363	362	365

THE COAL FIELDS OF UTAH

The U. S. Geological Survey has published a number of bulletins describing most of the coal fields in the State, and the State Geologist, Wm. Peterson, is now making a further detailed study of the coal beds. There is, however, no general summary and map which would be convenient for reference to anyone desiring a general knowledge of Utah's coal. To supply this need, the accompanying map has been prepared to show the approximate location of all the different coal fields, which are briefly described as follows:

Henry Forks Field.

Coal has been found in the vicinity of Henry Forks Valley in northeast Utah and southern Wyoming. Opposite Linwood postoffice, about one-quarter of a mile north of Henry Forks, two thick beds are exposed, outcropping in an almost vertical position. The beds are 8 ft. 9 in. and 10 ft. thick, respectively, without partings, and are of apparently a good grade of coal. Other beds are exposed along Spring Creek and on the north side of Henry Forks. No estimate is given of quality or tonnage.

The Vernal Field.

As shown on the map, coal is found from the Colorado line to west of Vernal. It occurs in two formations—the Mesaverde and the Mancos, both of cretaceous age. The coal is classed as low grade bituminous; the beds dip 14 degrees to 20 degrees and are up to 7 feet thick, but frequently contain impurities which, taken with the fact that they are far from transportation facilities, makes the coal of value for local consumption only. There are several wagon mines operating in this field, all on beds in the Mancos formation. Further information can be found in Bulletin 415 of the U. S. Geological Survey.

The Deep Creek Coal Field.

This is a small isolated area of coal, 10 miles northwest of Vernal, and about 15 miles north of Fort Duchesne. The coal occurs in the Mancos formation and is of similar quality to the Vernal coal. There is only one workable seam, which is from 3 to 6 feet thick and dips 15 degrees. The coal frequently contains partings of shale and bone, which make it of value for local consumption only.

The Government Mine, of the U. S. Indian Service, is the only mine at present operating, but the Larson Mine, of the Littlewater Coal Company, was formerly a producer.

This field is described in Bulletin No. 471 of the U. S. Geological Survey.

Black Tail Mountain Field.

The Black Tail Mountain Coal Field lies in Wasatch County and extends from about 5 miles northwest of the town of Tabiona across the Duchesne River, along the head of Red Creek, and across to the head of Currant Creek. Its length is about 32 miles and it contains an area of about 150 square miles. It is much the most important coal area in the Uintah Basin, for the reason that it contains a large number of thick, clean coal beds. The eastern end of the field contains the coal only in the Mancos formation and one mine is opened on the Winchester bed and is now operated, under lease from the Indian Service, by B. T. Clark, of Tabiona, Utah. The bed at this point is 5 feet in thickness and contains no partings.

Farther west, in the Black Tail Mountain Field, on the head of Red Creek, a number of workable seams are found, both in the Mesaverde formation and the Mancos shale. One of the coal beds in the Mesaverde, known as the Fraughton bed, is 20 to 25 feet thick, and practically clean coal.

In the Mancos shale one bed reaches a depth of 18 feet in places, but the coal apparently occurs in great lenses and is not uniform in thickness.

There is no work being done in this part of the Black Tail Mountain Field nor in that part which lies on Currant Creek. The coal dips at a very steep angle varying from 45 degrees to 58 degrees and is somewhat crushed, due to the folding of the rocks. The crushing action, however, is not great, but means that the percentage of lump coal will not be as large as would be secured from undisturbed beds. The pitch of the seam is not a serious disadvantage, on account of the fact that Red Creek has cut a deep valley through the formations and there are probably five million tons of coal which can be mined from the hills above water level.

A further description of this field can be found in Bulletin No. 417 of the U. S. Geological Survey.

It will be noted on the map that the Black Tail Mountain Field, as well as Deep Creek and Vernal fields, is far distant from railroad transportation. There is a probability, however, that a railroad will be built from Springville, Utah, over the Wasatch Range and down the Strawberry

River Valley. This will bring transportation facilities within 20 miles of the Black Tail Mountain Field, which is the commercially important field in this part of the State. A branch line could be constructed, without any unusual cost, up Red Creek if the condition of the market warranted opening the field.

The Coalville Field.

This field of coal, lying adjacent to the U. P. Railroad, in Summit County, Utah, was one of the first coal fields in the State to be opened and coal from it was hauled by ox team to Salt Lake City over fifty years ago. The beds are considerably folded, the dip varying from 10 degrees to 25 degrees. A number of mines have been opened, and there are at present three well equipped mines operating, all on the Wasatch seam, which is the principal seam of the area. The coal varies in thickness from 8 to 14 feet and contains very little impurities. Its heat value ranges from 11,039 to 11,800 British thermal units but, due to the high moisture content, it crumbles and slacks on exposure to the air and is, therefore, not suitable for storing. It gives out very little smoke or soot and finds a market in nearby cement plants, also at the mines of the Park City district.

This field is described in Bulletin 581-e, of the U. S. Geological Survey.

The Morgan County Coal Field.

About 10 miles northeast of Devil's Slide, in Morgan County, there is a small area of coal which has been opened by wagon mines in past years but has not proven of commercial importance. It is described in Bulletin 621-j of the U. S. Geological Survey.

Coal in Sanpete and Sevier Valleys.

Coal is found both east and west of Sanpete Valley in Sanpete County and on the east side of Sevier Valley, east of Salina and Sterling, Utah. Small mines have been operated in this part of Utah for a number of years but the coal seams are not so thick and the coal has higher ash and sulphur contents, and, for these reasons, has never been able to compete with the larger mines of Carbon County, except for strictly local consumption.

Coal in Carbon County.

Carbon County, Utah, produces 90 per cent of the coal mined in Utah, and, due to the number and thickness of the beds, quantity of the coal and accessibility to rail transportation, can be classed as one of the great coal fields of the world. There are from two to five workable seams, some reaching an average thickness of 27 feet, with practically no impurities, and very few of the mines are working coal less than 7 feet in thickness. The average of all mines would probably be 18 to 24 feet of coal in two seams. The coal is a good grade bituminous coal, and the eastern part of Carbon County contains a good coking coal. The Utah Fuel Company, at Sunnyside, has two mines producing coking coal and the same class of coal extends both ways from their property for a number of miles.

The Carbon County Coal Field, due to its great extent, has been usually divided into different geographical or topographical districts for discussion. The northern part of the field is considered as part of the Book Cliffs Field, while the southern part is part of the Castle Valley Field. For convenience, however, the Main Carbon County Field may be considered as extending from Sunnyside westward to Castle Gate, thence southward by Spring Canyon and Wattis to Hiawatha, and Mohrland in Emery County. In the northern part of the field the coal dips northeastward from 5 degrees to 18 degrees, gradually becoming more nearly level, until at Hiawatha it dips but very slightly. The pitching veins are opened by slopes and the flat veins by drifts. A number of the mines are located on the Cliffs considerably above the tippie sites, making necessary the use of surface inclines. There are no shaft mines.

Pleasant Valley Coal Field in Carbon County.

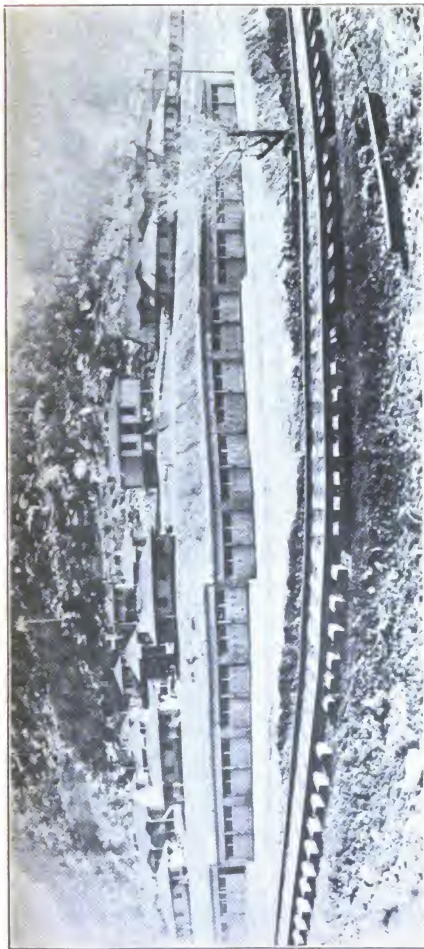
This field includes the coal in the western part of the county, in the neighborhood of Scofield, Winter Quarters and Clear Creek. It is described in Bulletin No. 316 of the U. S. Geological Survey. In the same bulletin is also described the Main Carbon County Field, including the outcrop from Kenilworth to Castle Gate, and south through the Spring Canyon district to Mohrland.

The Book Cliffs Field in Carbon County

The Book Cliffs Field takes its name from the high bluffs or cliffs which form a permanent rim north of and roughly parallel to the Denver and Rio Grande Railway from Helper, Utah, to Palisades, Colorado. The Mesaverde



TIPPLE AND CAMP OF THE UTAH FUEL COMPANY AT CASTLE GATE, UTAH
Castle Gate is One of the Oldest Coal Camps in the State. The main line of the Denver Rio & Grande Railroad is Seen Passing Under the Tipple



PARTIAL VIEW OF THE CAMP OF THE STANDARD COAL COMPANY

Standardville, Utah — Showing Modern Houses and in the Foreground Garages for the Automobiles of Employees

coal-bearing formation is found in these cliffs throughout its entire distance and, at most points, the seams are of commercial importance.

A description of this field, as far west as Sunnyside, Utah, will be found in Bulletin 371 of the U. S. Geological Survey.

The Book Cliffs Field in Grand County, Utah

As before stated, the Mesaverde coal-bearing formations extend from Carbon County, Utah, well across into Colorado, just north of the Denver and Rio Grande Railway. Coal beds of commercial importance are found throughout practically the entire distance and in Grand County, Utah, one large mine is being operated at Neslen, owned by the American Fuel Company.

The Castle Valley Coal Field in Emery and Sevier Counties

Castle Valley is the name given to the broad monoclinical area that extends from Price, Utah, southwestward for a distance of 80 miles. It parallels the eastern foot of the Wasatch uplift and on its westward slope is fringed with coal seams for the entire distance. A valley is formed in the easily eroded Mancos formation, and above this lies the Mesaverde formation, which is distinguished by steep massive sandstone cliffs. Tremendous deposits of workable coal are opened in the Mesaverde formation from Castle Gate to Hiawatha, in Carbon County.

Southward in Emery County, coal seams as thick as 32 feet are being mined at Mohrland. The same formation is found on both sides of Huntington Canyon where at least 19 feet of workable coal is found in two seams, one seam being 12 feet in thickness and the other 7 feet.

South of the town of Huntington, the Mesaverde formation has not been thoroughly prospected but it continues for many miles southward, as indicated by the dotted lines on the map, and in Section 22, Township 25 South, Range 4 East, the formation is known to contain at least one 12-foot seam of coal. Also, from the town of Emery, southward for 25 miles the Mancos shale is coal-bearing. The coal beds in this formation are at least 14 in number, some of which reach thicknesses up to 20 feet of clean coal. The beds dip gently to the westward and form a tremendous reserve for future mining.

The Escalante Coal Field in Garfield County

About 40 miles south of the southern terminus of the Castle Valley Coal Field, coal is again found along the head waters of the Escalante River, near the town of Escalante, which is said to extend southward to Henrieville. No detailed investigation of this field has ever been made, so far as the writer is aware, but there are reported to be three seams of coal. A lower vein 6 feet in thickness, a middle vein 24 feet in thickness, and an upper vein 8 feet in thickness. A specimen sample of this coal, taken from a pile outside of the mine, was furnished by one of the operators and gave the following analysis on an air dried basis:

	Per Cent
Moisture	11.55
Volatile matter	37.23
Fixed carbon	47.64
Ash	3.58
Sulphur	(.59)
Heat value in British Thermal units.....	11,107

The New Harmony Coal Field in Washington County, Utah

In Washington County, near the town of New Harmony, coal formations outcrop for a distance of 3 miles. The coal dips from 45 degrees upward, due to the strata being disturbed by intrusives, and these intrusives have also served to metamorphose some of the coal so that it resembles anthracite. The beds are thin and the coal has a high ash content, and although considerable prospecting has been done no commercial mines have been opened.

The Colob Coal Field.

From Cedar City, south to Kanarra, and then south-eastward to Mt. Carmel, Utah, coal outcrops in lower cretaceous rocks. A number of wagon mines have been opened in the vicinity of Cedar City and Kanarra, but the rest of the field is practically unprospected. The coal is of a good grade, with gentle dips of from 1 degree to 2 degrees north-east. Several partings occur in the seams around Cedar City, but farther south the beds are cleaner.

One interesting occurrence in this field is the presence of cannel coal in a limited area on the north fork of the

Virgin River. This coal gives a high yield of oil per ton, as is shown by the following analysis:

Gallons of oil per ton, 68.8.
Specific gravity of the oil, .9045.
Setting point, 36 degrees centigrade.
Per cent ash in the coal, 22.2.
Per cent nitrogen, 1.30.

A complete description of this coal field can be found in Bulletin 341 of the U. S. Geological Survey.

The Kanab Coal Field, Kane County.

The Kanab coal field is an extension of the Colob coal field and is only separated from it by the Sevier fault, which has a throw of 2,000 feet. The coal is of the same variety as that in the major portion of the Colob field but the beds are thinner, and, due to the extreme isolation from transportation, are of value only for local consumption.

Analyses of Utah Coals.

The following table shows analyses of coals from most of the fields. Some of these analyses, however, especially in the less developed fields, are of coal near the outcrop and the coal farther under cover will undoubtedly show higher heat values. For more complete analyses, the reader should refer to Bulletins 22, 85 and 123 of the U. S. Bureau of Mines.

FIELD	Kind of Coal	Air Dry Loss, %	Moisture, %	Vol. Matter, %	Fix. Carbon, %	Ash, %	Sulphur, %	B.t.u.'s	Estimated Total Tonnage
Colob	Sub-bitum.	1.4 - 4.7	3.58-16.64	33.91-37.78	38.90-46.96	4.88-13.99	1.25 - 6.82	8,202-11,374	2,672,803,840
Harmony	Sannel	1.1 - 4.5	6.32-11.77	43.89-47.48	22.73-23.32	1.62-23.50	.38- 1.61	9,956-10,470	
Harmony	Sannel	3.6 - 3.2	3.17- 6.57	4.68-13.39	47.48-62.37	22.73-23.32	2.41- 4.51	9,956-10,470	
Harmony	Sub-bitum.	4.5 - 1.5	3.51- 8.53	32.64-34.60	43.75-52.72	4.55-13.96	1.41- 1.59	11,061-12,061	
Rock Cliffs (Proper)	Bituminous	2.9 - 4.10	2.51- 6.53	33.14-40.9	52.50-54.27	4.35-18.39	.69- 1.30	11,700-12,000	5,000,000,000
Rock Cliffs (Summit)	Bituminous	1.3 - 3.10	2.73- 6.52	33.14-40.9	52.50-54.27	6.25- 8.53	.47- 1.79	11,327-13,419	
Main Carbon County	Bituminous	3.10- 3.9	4.04- 4.37	39.64-45.62	44.26-49.60	4.43- 9.09	.38- 1.58	12,500-13,412	
Pleasant Valley	Bituminous	2.5 - 3.5	2.96- 5.15	40.12-44.92	47.86-49.85	5.46- 6.02	.58- .89	12,500-13,000	
Huntington Canyon	Bituminous	0.3 - 17.0	3.1 - 8.9	37.0 - 42.2	40.1 - 50.9	4.10- 6.80	.32- .85	9,430-13,000	1,429,000,000
Emery (Castle Valley)	Bituminous	0.1 - 9.0	6.1 -10.83	35.97-42.3	45.1 - 47.27	5.93- 6.5	.99- 0.96	10,355-11,410	1,857,600,000
Black Tail Mountain	Bituminous	0.0	11.55	37.23	47.64	3.58	0.59	11,107	
Escalante	Bituminous		2.4 - 3.6	29.16-35.7	44.68-46.0	15.73-22.51	0.99	10,390-11,857	
Sanpete County	Bituminous	4.5	7.1	37.3	48.6	7.0		11,920	49,461,000
Deep Creek	Bituminous								

LIST OF COAL MINING COMPANIES OF UTAH

(Numbers show location on the map of the coal fields)

CARBON COUNTY

- (8) CAMERON COAL CO. F. H. Rolapp, Vice-President, Gen. Mgr., Newhouse Bldg., S. L. C. Mine at Castle Gate, Utah. Charles Leger, Supt. Seaton, Mine Foreman.
- (16) CARBON FUEL CO. L. F. Rains, President, 621 Newhouse Bldg., S. L. C. Mine at Rai Utah. Walter Wetzel, Supt. (Carbon & Mor Mines.)
- (11) INDEPENDENT COAL & COKE CO. J. H. T kin, Mgr., 1511 Walker Bank Bldg., S. L. C. Mine at Kenilworth, Utah. Wm. Ellwood, Supt. Bob Smith, Mine Foreman.
- (7) KINNEY COAL CO. Wm. Monay, Mgr., Kearney Bldg., S. L. C. Mine at Scofield, Utah. B. Manley, Supt.
- (15) LIBERTY FUEL CO. F. N. Cameron, Vice-President, 811 Kearns Bldg., S. L. C. Mine at Latu Utah. Geo. Schultz, Supt. Gus Goodart, Mine Foreman.
- (17) LION COAL CO. D. H. Pape, Gen. Mgr., Ogden Utah. Mine at Wattis, Utah. W. L. Reid, Supt. Wattis, Utah.
- MUTUAL COAL CO. Fred Leonard, Mgr., Cull Hotel, Salt Lake City, Utah. Mine at Rain Utah.
- (12) PEERLESS COAL CO. Ezra Thompson, President, Newhouse Bldg., S. L. C. Mine at Peerless Utah. Robert Howard, Supt., Peerless, Utah.
- (6) SCOFIELD COAL CO. J. H. Martin, Vice-President, Evanston, Wyo. Mine at Scofield, Utah. E. Newren, Supt. Andrew Hood, Mine Foreman.

1. The first part of the paper is devoted to a general discussion of the problem of the origin of life.

2. The second part is devoted to a discussion of the problem of the origin of the cell.

3. The third part is devoted to a discussion of the problem of the origin of the organism.

4. The fourth part is devoted to a discussion of the problem of the origin of the species.

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OF
THE
ROYAL
ANTHROPOLOGICAL
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VOLUME
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OF COAL MINING COMPANIES—(Continued)

SPRING CANYON COAL CO. Jesse Knight, Prest. J. Will Knight, Mgr., 817 Newhouse Bldg., S. L. C. Mine at Storrs, Utah. Geo. Murphy, Supt. Otto Reichart, Mine Foreman.

STANDARD COAL CO. 924 Kearns Bldg., S. L. C. Mine at Standardville, Utah. F. C. Hennes, Supt. Harry Parmley, Mine Foreman.

UNITED STATES FUEL CO. Moroni Heiner, Vice-Prest., Kearns Bldg., S. L. C. R. M. Magraw, Gen. Supt., Hiawatha, Utah. Mines at:

Black Hawk, Utah. C. N. Orr, Supt. J. Taylor, Mine Foreman.

Hiawatha, Utah. Otto Herres, Supt. John Jones, Mine Foreman.

Panther, Utah. J. E. Pettit, Supt. and Mine Foreman.

UTAH FUEL CO. A. H. Cowie, Vice-Prest. H. G. Williams, Consulting Mgr. A. C. Watts, Chief Engineer and Geologist, Judge Bldg., S. L. C. Mr. Wm. Littlejohn, Gen. Supt., Castle Gate, Utah. Mines at:

Castle Gate, Utah. W. J. Bowns, Supt. Oliver Sutch, Asst. Supt. Geo. A. Wilson, Mine Foreman No. 1. Zeph Thomas, Mine Foreman No. 2. Clear Creek, Utah. Thos. A. Stroup, Supt. H. H. Norgard, Mine Foreman.

Sunnyside, Utah. Emil Ostlund, Supt. Dave Crawford, Mine Foreman No. 1. John Thorpe, Mine Foreman No. 2.

Winter Quarters, Utah. Thos. C. Harvey, Supt. Horace Simpson, Mine Foreman No. 1. R. J. Stone, Mine Foreman No. 2. (

Utah Mine, Utah. Thos. W. Tweeddale, Supt. Wm. S. Wilde, Mine Foreman.

DUCHESNE COUNTY

BEN CLARK. Tabiona, Utah. (Leased from the Government.)

LIST OF COAL MINING COMPANIES—(Continued)**EMERY COUNTY**

- (20) UNITED STATES FUEL CO. Moroni Heiner Vice-Prest., Kearns Bldg., S. L. C. R. M. Magraw, Gen. Supt., Hiawatha, Utah. Mine at Mohrland, Utah. F. C. Hill, Supt. Peter Forster, Mine Foreman.

IRA BROWNING. 450 Capitol Bldg., S. L. C. Queatchuppah Mine No. 1.

KNIGHT INVESTMENT CO. Provo, Utah.

THOMAS LAMPH. Orangeville, Utah.

GRAND COUNTY

AMERICAN FUEL CO. R. W. Van Derck, Mgr., Ut. Sav. & Tr. Bldg., S. L. C. Mine at Sego, Utah. M. C. Moffett, Supt. R. J. Carns, Asst. Supt.

IRON COUNTY

T. S. ATKINS. 60 East South Temple, S. L. C. Corry Mine, Cedar City.

URIAH JONES. Cedar City, Utah. Jones-Bullock Mine. Heber Jensen, Lessee.

THE LUNT MINE. Cedar City, Utah. Steven & Nelson, Lessees. (H. H. Lunt, Mgr.)

WM. REEVES. Kanarra, Utah.

ED. H. WHYTE. 1522 Fulton St., San Francisco, Calif. Ed. Whyte Coal Mine.

JESSE F. WILLIAMS. Kanarra, Utah.

THE WOOD & TAYLOR MINE. Cedar City, Utah. John Holland, Lessee.

ANDREW CORRY. Cedar City, Utah.

LIST OF COAL MINING COMPANIES—(Continued)**SANPETE COUNTY**

OLE BLACK. Sterling, Utah. Ole Black Mine.
Owned by Sam Duggins and Marinus Beauregard, Gunnison, Utah.

ALBERT CHRISTENSEN. Fairview, Utah. New York Mine. Owned by Utah Fuel Company.

JOSEPH JENSEN. Sterling, Utah. Morrison Mine 3 miles east of Sterling.

H. R. THOMAS. Wales, Utah. Wales Mine.

SEVIER COUNTY

J. F. LIVINGSTON & GEO. IVORY. Fountain Green, Utah. Livingston Mine. 16 miles east of Salina, Utah.

SUMMIT COUNTY

CHAPPELL BROS. COAL CO. Coalville, Utah.
Mine at Coalville, Utah.

GRASS CREEK FUEL CO. Grass Creek, Utah.
Mine at Grass Creek. Mr. J. H. Roberts, Supt.

WEBER COAL CO. H. C. Cohen, Secy., 163 South Main St., Salt Lake. Mine at Coalville, Utah.
J. T. Lewis, Supt.

UINTA COUNTY

GEO. GRAY & SON. Vernal, Utah. Mine (North Star) at Vernal, Utah.

LITTLEWATER COAL CO. Vernal, Utah.
PACK & ALLAN. Vernal, Utah. Mill Mine, 10 miles from Vernal.
JOS. RICH. Vernal, Utah.

U. S. INDIAN SERVICE. Deep Creek, Utah.
(Government Mine.)

PRODUCTION OF COAL IN UTAH, 1870-1918, IN SHORT TONS

Year	Quantity	Value	Year	Quantity	Value
1870	5,800	\$ 8,816	1895	472,958	\$ 661.14
1871	8,228	11,871	1896	503,243	729.69
1872	10,056	15,486	1897	588,092	762.54
1873	16,411	26,258	1898	673,297	848.35
1874	21,555	34,488	1899	878,122	927.53
1875	32,912	51,131	1900	1,233,978	1,419.07
1876	50,400	78,611	1901	1,382,470	1,603.66
1877	50,400	79,117	1902	1,641,436	1,887.65
1878	67,200	102,510	1903	1,782,178	2,085.14
1879	225,000	346,500	1904	1,563,274	1,988.45
1880	225,800	348,617	1905	1,602,528	2,099.30
1881	250,000	381,914	1906	1,839,219	2,464.55
1882	250,000	382,728	1907	1,967,651	2,715.35
1883	250,000	381,619	1908	1,844,849	3,025.54
1884	250,000	382,415	1909	2,322,209	3,831.64
1885	213,120	319,680	1910	2,526,093	4,420.68
1886	200,000	302,218	1911	2,501,471	4,801.82
1887	180,020	277,230	1912	3,088,356	5,219.32
1888	259,501	392,711	1913	3,289,265	5,658.35
1889	236,651	355,872	1914	3,149,491	5,354.18
1890	236,651	355,872	1915	3,108,715	4,916.91
1891	371,045	560,277	1916	3,567,428	5,795.94
1892	361,314	560,036	1917	4,125,230	8,531.38
1893	418,649	606,171	1918	5,136,825	13,937.09
1894	447,276	639,404			
Totals				55,424,967	\$92,537.58

TONNAGE PRODUCED, 1919

Totals

January	387,948
February	318,781
March	322,027
April	247,342
May	297,228
June	349,055
July	386,211
August	426,262
September	407,152
October	470,649
November	467,473
December	533,594
Miscellaneous small mines	16,000 (Est.)

4,629,722

SUMMARY OF COAL PRODUCED, 1918

COUNTY	Total Tons	Value	Tons Loaded at Mine for Shipment	Employees		Total	Days Worked
				Underground	Surface		
Carbon	4,607,192	\$12,529,485	3,736,898	2,675	1,000	3,675	261
Emery and Grand	453,172	1,205,805	442,892	307	70	377	256
Summit	63,759	160,600	58,928	76	23	99	221
Utah and Duchesne	3,882	12,887	None	7	2	9	222
Miscellaneous							
Small Mines	8,820	28,370		6		*6	
State total	5,136,825	\$13,937,097	4,238,718	3,071	1,095	4,166	259

1917

State total	4,125,230	\$ 8,531,382	3,292,758	2,569	916	3,485	219
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1916

State total	3,567,428	\$ 5,795,944	2,686,880	2,397	732	3,129	228
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* Only six employees reported.

TONS OF COAL MADE INTO COKE AT THE MINES

1916	1917	1918
736,853	669,316	738,302

**DISTRIBUTION OF COAL FROM UTAH'S MINES
IN 1917 AND 1918**

(From figures of the U. S. Fuel Administration)

	1918	1917
Tons produced that were shown in the distribution	5,096,372	4,103,226
Made into coke at the mines	738,302	669,315
Railway fuel	1,088,977	876,582
Used in Utah	1,532,885	1,510,797
Shipped to Nevada	325,660	182,156
Shipped to California	633,522	352,424
Shipped to Idaho	436,460	340,971
Shipped to Oregon	132,015	30,739
Shipped to Washington	106,870	25,010
Shipped to Montana	48,056	20,415
Shipped to Colorado	683	1,310
Used at mines and local sales	52,289	93,508

Shipped from southern Wyoming into Utah in 1917—385,227 tons; in 1918, 220,000 tons.

SUMMARY OF DISTRIBUTION OF COAL
Produced in the Rocky Mountain and Pacific Coast
States, 1918—(Net Tons)

USE OR DESTINATION	New Mexico	Colorado	Utah and Southern Wyoming	Montana and Northern Wyoming	Washington
Used in home State; sold to local trade, not shipped	39,000	436,000	119,000	256,000	74,000
Used at mines for steam and heat	40,000	311,000	258,000	266,000	194,000
Made into coke at mines	1,108,000	1,080,000	738,000		155,000
Shipped to points in home State	217,000	4,519,000	1,987,000	1,512,000	1,088,000
Total used in home State	1,404,000	6,346,000	3,102,000	2,034,000	1,511,000
Shipped to other States—					
Arizona	225,000	10,000			
California	56,000	6,000	654,000		18,000
Colorado	54,000		17,000	1,000	
Idaho		5,000	543,000	21,000	7,000
Iowa		135,000	47,000	236,000	
Kansas	78,000	784,000	15,000	1,000	
Minnesota				15,000	
Missouri		6,000	2,000	14,000	
Montana			274,000		
Nebraska		1,133,000	344,000	590,000	
Nevada			445,000		
New Mexico		83,000			
North Dakota				154,000	
Oklahoma	31,000	145,000			
Oregon			267,000	1,000	161,000
South Dakota		30,000	12,000	251,000	
Texas	235,000	399,000			
Utah		1,000			
Washington			157,000	105,000	
Wyoming		54,000			
Total shipped to other States	679,000	2,791,000	2,777,000	1,389,000	186,000
Delivered to railroads by all-rail routes	1,736,000	3,247,000	5,553,000	4,183,000	1,871,000
Exported by rail	74,000	24,000			20,000
Shipped to Tidewater	130,000		70,000		494,000
Total production	4,023,000	12,408,000	11,502,000	7,606,000	4,082,000

NOTE: Figures by U. S. Geological Survey. These figures are revised and do not check in some cases with those of the Fuel Administration.

**TONNAGE PRODUCED BY PRINCIPAL MINES
OF UTAH IN 1919**

Company—	
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Cameron Coal Co. (Royal)	146,482
Carbon Fuel Co.	265,906
Grass Creek Fuel Co.	32,155
Independent Coal & Coke Co.	344,723
Liberty Fuel Co.	170,741
Lion Coal Co. (Wattis)	136,593
Peerless Coal Co.	154,865
Scofield Coal Co.	123,540
Spring Canyon Coal Co.	296,217
Standard Coal Co.	272,029
U. S. Fuel Co.	1,058,831
Utah Fuel Co.	1,480,233
Weber Coal Co.	16,878
Other Mines (partly estimated)	130,529
Total	4,629,722

**COAL PRODUCED IN UTAH THE FIRST
SIX MONTHS OF 1920**

January	589,668
February	515,214
March	527,606
April	298,424
May	400,938
June	531,600
Small Mines (estimated)	12,000
Total	2,875,450

COKE IN UTAH

The first efforts to make coke in Utah were in the early fifties, when small beehive ovens were built near Cedar City in an endeavor to coke the coal of the Colob coal field for use in smelting iron ores just west of Cedar City. The coke produced was friable and carried about 5% sulphur, which made it unsuitable for the smelting operations.

In 1878 ten beehive ovens were constructed at Connellsville, in Huntington Canyon, and the coke, although not of a high grade, was hauled to the smelters operating in Salt Lake Valley.

In 1890, the Pleasant Valley Coal Company erected eighty beehive ovens at Castle Gate and for nearly ten years coal from the "A" seam was coked for use in the state's smelters.

In 1898, it was found that the coal at Sunnyside was a good coking coal and mines were opened at Sunnyside, where are now the only ovens in operation in the state. The Sunnyside plant consists of 819 beehive ovens of 12 and 13-foot size, which makes it the largest single beehive plant in operation in the United States. The coke produced is an excellent metallurgical coke and it is used by the four smelters operating in Utah. It runs from 83% to 87% fixed carbon, 11% to 13% silica, $\frac{1}{2}\%$ to 1% sulphur, and .3% to .5% phosphorous.

The following table gives the production of coke in Utah, 1890 to 1917, and the tons of coal made into coke from 1916 to 1918:

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1890	8,395	1897	23,619	1904	156,337	1911	174,000
1891	7,947	1898	28,327	1905	220,706	1912	302,457
1892	7,242	1899	26,882	1906	259,924	1913	332,396
1893	16,007	1900	32,730	1907	317,925	1914	349,898
1894	16,057	1901	32,860	1908	180,074	1915	301,420
1895	22,517	1902	78,230	1909	184,745	1916	424,828
1896	20,449	1903	158,099	1910	150,677	1917	374,775

TONS OF COAL MADE INTO COKE

Year	Tons	Year	Tons	Year	Tons
1916	736,853	1917	669,316	1918	738,302

PRODUCTION OF HYDRO-CARBONS IN UTAH

Utah is one of the few places in the world where the hydro-carbon minerals, gilsonite, elaterite and ozokerite, are produced. These minerals are valuable for many uses, principally in the manufacture of high class paints and varnishes, electrical insulating material, and as a substitute for rubber. The veins occur in vertical fissures in sedimentary rocks, and they are usually mined by underhand stoping from the surface.

At present, there is no ozokerite being produced, but four companies are producing gilsonite and one is producing elaterite. The gilsonite mining companies are the Gilson Asphaltum Company and the American Asphalt Association at Watson, Utah, and the Raven Mining Company and the Basin Gilsonite Mining Company at Myton, Utah. Mr. H. D. Ford is superintendent of the Gilson Asphaltum Company, Mr. E. V. Deshayes of the American Asphalt Association, Mr. Fred C. Feron of the Raven Mining Company, and Mr. Charles Walker of the Basin Gilsonite Mining Company. The Raven Mining Company is also the sole producer of elaterite which comes from their mine on Big Indian Creek, southwest of Duchesne, Utah.

The following figures show the activity of the industry in 1918-19:

Year	Tons of Gilsonite and Elaterite produced	Underground Employees	Surface Employees	No. of Days Active
1918	31,918	38	21	328
1919	32,857	36	30	318

Gilsonite was worth about \$27, and Elaterite \$65 to \$75 per ton, f. o. b. cars at main line railroad points during 1918-19.



**Hoisting Sacks of Gilsonite at the Mines of the
Gilson-Asphaltum Company**



**Starting Work on One of the Gil-
sonite Mines of the Gilson-
Asphaltum Company**

OIL AND GAS DEVELOPMENTS

A great many inquiries have been received by the Mine Inspection Department regarding the oil possibilities of Utah. In order to furnish the information, as regards operations in the past, the following review of oil and gas prospecting is abstracted from Bulletin 711-A of the U. S. Geological Survey:

"San Juan Field—Oil occurs in the San Juan field in rock of upper Pennsylvania age (Goodridge formation), which contain five reported oil-bearing sands at about the following depths below the top of the Goodridge formation; Baby, 29 feet; Goodridge, 74 feet; Third, 190 feet; Mendenhall, 231 feet, Little Loop, 381 feet. Oil seeps are reported to occur at several localities in the Goodridge formation along San Juan River westward from Goodridge to boundary of the field. At some places the oil seeps from crevices and at others it saturates the unbroken rock, but the oil impregnation seems to be local and to occur at no definite horizon in the sand. Several wells were drilled no deeper than the Baby sand, but most of them went as far as the Goodridge sand and a few penetrated to a depth of 1,425 feet. Woodruff believes that as all the wells with more than a good showing of oil are in the syncline the area of basin structure contains most of the oil. In this field during 1916 one dry hole was completed and one well formerly classed as a producer was abandoned. The five other wells in the field reported as capable of producing were closed through lack of marketing facilities.

Green River—Prospecting for oil near Green River has extended over 20 years, and interest has several times been revived by the increasing demand for petroleum and by the discovery of other oil seeps. Two wells, Levi No. 2 and Collins, have penetrated Lupton's McElmo and entered the underlying La Plata sandstone. The Levi well, in sec. 35, T. 22 S., R. 17 E., was drilled to a depth of 1,500 feet, and the Collins well, in Sec. 2, T. 21 S., R. 17 E., to a depth of 2,100 feet. No oil or gas was reported from the Levi well, but gas was reported in the Collins well at 850 feet (in Dakota

sandstone) and at 976 feet, gas and salt water at 1,840 feet, and dry gas at 1,980 feet. Rainbow colors on the water accompanied each flow of gas. Most of the other wells in this area were drilled into the McElmo, but a few stopped in the overlying Mancos shale, from which most of the gas was derived.

The results of drilling up to 1912 gave little encouragement for further exploration, because three out of seven wells proved to be dry holes, three encountered traces of oil and small quantities of gas, and one struck "pockets" of gas without oil. The Green River field contains no anticlines or domes favorable for large accumulations of oil or gas.

San Rafael Swell—Several wells have been drilled for oil or gas southeast of the San Rafael Swell, and northeast of Hanksville, near the junction of Fremont and Dirty Devil rivers, in Tps. 26 and 27 S., R. 12 and 14 E., in Emery and Wayne Counties. A well 600 feet deep was drilled just south of the "Flat-Tops" in sec. 18 or 19 (unsurveyed), T. 26 S., R. 13 E., which possibly passed through Lupton's McElmo formation and penetrated about 35 or 40 feet into the La Plata sandstone, but found no oil or gas. The Des Moines Oil Company's well near the center of Sec. 29, T. 26 S., R. 14 E., had in November, 1912, been sunk to a depth of 2,140 feet but did not obtain oil or gas. It is estimated that the upper 600 feet of this well was in the Navajo and Toddlite; from 600 feet to 1,325 feet the drill penetrated the Wingate. Fresh water was encountered at several horizons from 310 feet down. The Mount Vernon Oil Company's well, 10 or 12 miles southwest of the Des Moines well, in the NE $\frac{1}{4}$ of Sec. 9, T. 27 S., R. 12 E., probably started in the Navajo and penetrated to a depth of 2,715 feet. Oil is reported to have been found in this well at 2,175, 2,530 and 2,655 feet below the surface, all of which may be in the Pennsylvania (?), but it is possible that the first show of oil, at 2,175 feet, was in younger rocks. These wells, according to Lupton, are near the axis of a broad, nearly flat east-west anticline which connects the San Rafael Swell, on the west, with another re-

ported anticline occupying a position near the junction of Grand and Green Rivers on the east.

Southwestern Utah—The rocks exposed in the Virgin River field range in age from Carboniferous to Eocene and so far as known contain oil only in the lower red beds, of probably Permian age. Oil seeps near Virgin, on Virgin River, in Washington County, southwestern Utah, have probably been known for many years, but no prospecting by drilling was undertaken there until recently. The first well, in the flood plain of North Creek about 2 miles north of Virgin, was drilled in the summer of 1907 to a depth of 610 feet and struck oil in the Permian (?) rocks at 556 feet. This well yielded oil at the rate of 10 barrels a day and stimulated the drilling of six other wells, none of which produced oil in paying quantities, but it is reported that some oil was found in all the wells. Interest in the Virgin River field has again been revived, but, although some drilling is reported, at the date of writing (September, 1918) there has been no commercial production. The oil has a specific gravity of 0.9225 (22 degrees Baume), contains some paraffin and a large percentage of asphalt, and is essentially a fuel oil. Richardson believes that the source of the oil is in the underlying Carboniferous limestone, that the oil-bearing rocks occur as lenses rather than as persistent beds, and that oil accumulated in this field only in lenticular beds and not in folds, because the rocks are flat-lying.

Great Salt Lake and Sevier Lake Basins—At many places in the Great Salt Lake and Sevier Lake basins considerable drilling for oil and gas has been done, but, so far as the writer knows, oil has not been encountered in commercial quantities.

Juab Valley—Several holes have been drilled in Juab Valley, near Juab, in Juab County, but no production of oil has been reported. The rocks exposed in the valley are probably Lake Bonneville beds. Rocks of Eocene age dip westward from Gunnison Plateau beneath the valley floor, but the writer has no knowledge of the local structure of the rocks in the vicinity of the wells.

San Pete Valley—A hole was drilled in the north end of the San Pete Valley near Mount Pleasant, but no information is available regarding the results. The beds that crop out on both sides of the valley are Tertiary.

Shores of Great Salt Lake—More or less interest and some excitement has for many years attended the drilling for oil and gas along the shores of Great Salt Lake. Oil has not been encountered in paying quantities, but considerable gas was produced by wells about 12 miles north of Salt Lake City. This drilling has probably been stimulated at various times by the gas bubbling from hot-water springs, by reports regarding "showings" of oil in water wells and springs, and by the occurrence of solid asphalt deposits such as those south of Rozel Hills, on the west side of the Promontory Range, on the north shore of the lake. A well was drilled to a depth of 2,480 feet near the Southern Pacific railroad track at Lemay, about 80 miles west of Ogden, but found no oil or gas. The drill penetrated, according to reports, 850 feet of clay carrying gypsum, fossiliferous limestone, and brown sandstone. Another well along the same railroad was drilled to a depth of 800 feet at Strong Knob, at the north end of the Lakeside Mountains, about 52 miles west of Ogden, and obtained some gas but no oil. Several shallow wells were drilled south of the Rozel Hills, on the west side of the Promontory Range, to test the extent of asphalt beds, but no wells deep enough to test the oil or gas possibilities of this region are reported. A well about 1 mile southwest of Farmington was drilled to a depth of 2,000 feet in unconsolidated lake beds but found no oil or gas. It is reported that another well is now (September, 1918) being drilled near the site of the old well, but no information is available regarding the results. Several wells drilled a few miles south of Farmington and about 12 miles north of Salt Lake City produced considerable gas. The deepest well was 1,400 feet deep but did not pass through the unconsolidated lake beds. The gas in most of the wells came from depths of 500 to 700 feet below the surface and was piped to Salt Lake City, where it was used for about 19 months, until the wells failed to yield

sufficient gas to pay the costs of operation. A deep well has been drilled on the south shore of the lake near Grant's Station, on the Western Pacific Railroad, and in April, 1916, oil was reported to have been encountered at a depth of 1,900 feet. Many shallow wells have been drilled for water on the east and south sides of the lake, but so far as known these wells have found no oil or gas. Drilling in the Lake Bonneville beds for oil or gas is attended with great uncertainties and is purely wildcatting, because the nature and thickness of the lake beds and the underlying bedrock are not known.

Since this resume was prepared by the Government geologist, additional drilling has been carried on, but so far as the writer is aware there is only one section of the State where oil is being produced at the present time. On North Creek, about a mile north of the town of Virgin, in Washington County, shallow wells about 500 feet deep have produced small quantities of oil. The Dixie Oil Company has been the principal operator and a small refinery has been operated intermittently. Farther west, in the same county, between St. George and Hurricane, the Virgin Dome Oil Company has been drilling for oil for some time, also other companies. The latest advices are that the deepest well had reached a depth of 2,200 feet but had not secured oil in commercial quantities. This field was described in the Salt Lake Mining Review under date of March 30, 1919.

Near Moab, Utah, there was considerable oil excitement in 1919 and a number of companies were organized for drilling. The principal work was done by the Big Six Oil Company, 3 miles southeast of the town of Moab, and a well was put down which, at last reports, was over 800 feet deep. Some oil was encountered, but not in commercial quantities.

In Uinta County, the Uinta Oil and Explroation Company put down one well about $1\frac{1}{4}$ miles north of Moffat, which reached a depth of 1,100 feet, and about 4 miles southeast of Moffat another well was started with a standard rig which, at last reports, was still drilling.

One of the most noteworthy attempts to find oil in Utah has been in Juab County just east of Juab station on the Los Angeles and Salt Lake Railroad. This drilling has been carried on by the Utah Petroleum Company, Mr. Fred J. Wheeler, Manager. The first well was started in the fall of 1908 and reached a depth of 2,400 feet. A second

well was drilled to a depth of 3,000 feet and a third well, about 7 miles southeast of Juab station, reached a depth of 2,400 feet. A fourth well was drilled to a depth of 3,829 feet. A fifth well is now being drilled which has reached a depth of 3,000 feet and is still being drilled. Oil in commercial quantities has not been secured but the indications in the wells were sufficient to encourage further drilling. The efforts of this company are deserving of success.

Since the new leasing laws went into effect a large number of companies have applied for oil leases or prospecting permits in Utah, and there promises to be a great deal of activity in the near future. Applications cover many different parts of the State. The largest number are confined to three different areas, namely, the Circle Cliffs region in Garfield County, near Caineville, in Wayne county, and on the San Rafael Swell in Emery County. There has also been considerable activity in San Juan County. At the present time, standard drilling rigs are being taken into nearly all of these fields. The developments being undertaken in the Circle Cliffs field are especially interesting, due to the great distance from the railroad and the roughness of the country which has to be traversed to get to the region. Drilling rigs for this field are unloaded at Marysvale and thence hauled around by way of Escalante.

OIL-SHALE WORK IN UTAH

By Martin J. Gavin, Refinery Engineer,
U. S. Bureau of Mines.

The oil-shale industry in the United States is still in an experimental stage. Some 15 or 20 retorts for producing oil from shale have been erected in various parts of the country, but these, with one or two possible exceptions, are all too small or operate under such conditions that little idea of their feasibility for commercial purposes can be determined.

The State of Utah probably ranks first among the states of the Union in content of oil-shale. The greater part of the shale in this state occurs in the northeast part and principally in the counties of Uintah, Duchesne, Carbon and Wasatch. While estimates have been made of the amount of oil-shale deposits occurring in this state, I would not venture to use these estimates or to make one of my own, because exploration and sampling work so far accomplished have been too inadequate to base reliable estimates on. Mr. D. E. Winchester, formerly of the United States Geological Survey, estimates that the Utah portion of the Uinta Basin contains sufficient shale to produce nearly forty-three billion barrels of crude shale oil. In any event, it may be stated that shale deposits of Utah indicate that ultimately the state will be a great producer of shale oil.

To reach a great stage of development, economic conditions throughout the country, of course, must be right. Primarily the success of the oil-shale industry will depend on the condition of supply and demand for petroleum products; particularly in the case of Utah adequate transportation facilities must be furnished to shale fields before any great measure of success can be obtained.

To my knowledge there are at present, five oil-shale plants of various sizes in the State of Utah; three of these are experimental plants in the city of Salt Lake, the other two are attempts at commercial plants, but apparently have capacities too small to consider them truly commercial. One of these plants is near Dragon, Utah, where one retort is now in operation and three more being erected. The estimated capacity of the completed plant is 50 tons of shale per day. North of Watson on the White River, another company has under construction a battery of 18 retorts with, according to the company's statement, an estimated capacity

of 400 tons a day. It is impossible to predict when this latter plant will be fully completed.

The staff working on oil-shale at the Intermountain Station, Bureau of Mines, consists of:

- M. J. Gavin, Refinery Engineer and in charge of oil-shale investigations for the Bureau.
- L. C. Karrick, Jr., Refinery Engineer.
- J. J. Jakowsky, Petroleum Engineer, Department of Metallurgical Research, State of Utah.
- R. D. Howard, "Fellow" on oil-shale investigations, Department of Metallurgical Research.
- Miss Louise A. Helson, Junior Clerk.

The work accomplished during the present calendar year has been the development of apparatus and methods for assaying oil shales for their oil content; the construction and operation of several laboratory types of retorts and the examination by distillation and chemical analyses of the oils produced from them and the sampling, assaying and chemical analyses of shales from various parts of this and other states. The principles of two or three proposed new types of retort systems have been studied and the oils produced from them examined. Samples of shale and crude shale oil have been obtained from the commercial plants of Scotland and have been studied and are being used as points of reference for the shale work. At the present time, work is just beginning on a new shale retort designed to make possible a study of the results of using steam and other gases in the distillation of oil shale. Conditions for the recovery of nitrogen from oil shales are also being studied. It is felt that much valuable work has been accomplished to date and that at least a beginning of knowledge of the complicated processes by which oil is produced from oil-shale has been established.

The following publications have been published by writers at this station during the year:

"Oil Shales and Their Economic Importance"

By M. J. Gavin.

"Oil-Shale Investigations of the Bureau of Mines"

By M. J. Gavin.

"The Necessity for Research in the Oil-Shale Industry"

By M. J. Gavin.

"Problems in the Production of Oil-Shale"

By L. C. Karrick and J. J. Jakowsky.

"Possibilities of Producing Oil From Oil-Shale"

By M. J. Gavin.

"The Next Mining Problem"

By M. J. Gavin.

At the present time there are in course of preparation three short papers giving results of work accomplished to date, and a manuscript for a regular bulletin of the Bureau of Mines on the oil-shale industry, has been completed and is ready to send to the Government Printing Office. It is expected that this bulletin will be ready for distribution early in the spring of 1921.

The Bureau of Mines is also co-operating with the State of Colorado in oil-shale studies. This latter work is directed from the Salt Lake office and the work at the two institutions is planned so that no duplication will result. In every possible way, the work in Utah and Colorado has been planned to yield results of value in the shortest possible time.

SAFETY INSPECTION WORK IN THE METAL MINES

The work of inspecting the metal mines for safety has been carried on by periodic visits to the mines which have averaged about one visit to each mine every four to five months. Utah had practically no laws covering metal mine inspection prior to the passage of the Workmen's Compensation Act and there had been no metal mine inspector. In the spring of 1919 a complete set of metal mine safety regulations was prepared, based on the recommendations of a national committee of metal mine operators. The report of the national committee was published in Bulletin No. 75 of the U. S. Bureau of Mines, and represented the results of over five years' investigation of the different State metal mining laws and the general safety needs of the industry. After a draft of safety regulations for Utah was prepared, based on the recommendations of this national committee, it was submitted to a local committee representing the mining industry of Utah. The personnel of this committee was as follows:

Representing Mine Operators:

- C. E. Allen, Gen. Mgr., United States Smelting, Refining & Mining Company, Mining Department, Salt Lake City, Utah.
- V. S. Rood, General Managar, Utah-Apex Mine, Bingham, Utah.
- O. N. Friendly, General Superintendent, Judge Mining & Smelting Company, Park City, Utah.
- A. P. Mayberry, Superintendent, Centennial-Eureka Mine, Eureka, Utah.

Representing Mine Employees:

Ephraim Adamson, Park City Miners' Union.
John McClean, Park City Miners' Union.

Representing the Insurance Companies:

W. E. Allen, Safety Engineer, Ocean Accident & Guarantee Company, Salt Lake City, Utah.
Julius Goodrich, Inspector, Aetna Life Insurance Company, Salt Lake City, Utah.

Representing the Industrial Commission:

Wm. E. Harrison, Metal Mine Inspector,
C. A. Allen, Mining Engineer, U. S. Bureau of Mines, Chief of the Mine Inspection Department.

A number of changes were suggested by this committee and after these were made, suggestions were received from the industry at large and the final regulations, as agreed upon, were made effective August 15, 1919. These regulations are officially known as "General Safety Orders Covering Underground Metal Mining Operations," and are as complete as it was considered practical to make them. With a few rare exceptions, the operators have shown the heartiest co-operation in making their safety conditions so as to comply with these orders. The Utah Chapter of the American Mining Congress, through its Board of Directors and its Secretary, Mr. A. G. Mackenzie, has given excellent co-operation of the same kind. Some of the provisions have put the mines to considerable expense. There previously had been but very few of the shaft cages equipped with gates or doors to prevent men from falling into the timbers while being hoisted. At the present time, due to the requirements of the orders, practically every shaft cage in the State is so equipped. Another provision required the guarding of trolley wires, that are under 6½ feet in height, wherever men pass under them. Most of the mines have already complied with this provision, some at considerable expense.

The matter of overwinding devices for hoists had also been overlooked at a number of mines in the state but since the adoption of the Orders, efficient safety devices have been installed at the larger mines. The restrictions, which were placed upon the use of dry drilling machines, were as drastic as they practically could be made, as it was realized that siliceous dust in metal mines is a cause of a large mortality among the miners. Up to the present, it has not been possible to secure all the benefits which were aimed at in the provisions regarding dust but every effort is being put forth to remove the danger as quickly as possible. One serious disadvantage has been that there were no wet stoping drills on the market which had proven satisfactory. There has recently been developed, however, at least one new stoper which uses water to allay the dust and their adoption in the mines of the State can be expected.

A decided improvement in the safety conditions of the underground workings of the metal mines since the adoption of the Safety Orders has been noted in the manner of guarding open holes. Ten to 15 per cent of underground accidents were formerly caused by men falling down open holes in the stopes, raises, chutes and ladderways. The Orders require all these holes to be railed off or else cov-

ered with grizzlies, in which the spaces are not over 11 inches wide. This has resulted in a gratifying decrease in the number of this class of accidents.

One of the difficult problems in accident prevention during the past few years has been to get the men to properly take care of themselves. There are a large number of miners in the mines today who are experienced and as careful as any miners have ever been but, unfortunately, on the other hand, a large percentage of "green" men have entered the mines who are neither careful nor efficient. The better class of miners have shown as sincere a willingness to co-operate with the Inspection Department in preventing accidents as have the operators themselves, but the "floaters" have, in many cases, shown an utter disregard of their own safety whenever it required any appreciable effort to make the conditions surrounding their work safe.



A WATER TANK WITH SPRAYS

For Allaying Rock Dust in Metal Mine Drifts.
Picture Taken at the Deer Trail Mine, Marysville, Utah.

The following tables show plainly where the accidents of the State are occurring and an effort has also been made in these tables to place the responsibility for the fatalities that have occurred. The large table gives the fatalities in Utah, as compared with those in other Western States, and it shows that Utah's fatality rate in metal mines is lower than most of the others.

FATAL ACCIDENTS**Metal Mines.**

Wm. E. Harrison.

1919.

L. J. Rushton was fatally injured January 1, 1919, at the Utah Copper Company gravel pit, Bingham, by delayed blast. Died next day. Left widow and 10 children.



A CUT-OFF SAW

Showing a Guard Placed Around Saw
Itself—Also Guard in Front of Belt
Which Drives the Saw. Picture Taken
at the Plant of the U. S. Smelting
Co., Midvale, Utah.

U. Kawaguchi was injured January 18, 1919, at the Utah Copper Mine, Bingham, by flying rock from blast. Died January 19.

Henry Salo (Maki) was injured February 6, 1919, at the Highland Boy Mine, Bingham, by falling ground from hanging wall, breaking both legs and hip. Died March 13. Leaves widow and two children.

N. Okada died February 9, 1919, as a result of being injured December 18, 1918, in open pit of Utah Copper Company.

Wm. Umbleby, age 29, was killed February 26, 1919, at the Utah Copper Mine, Bingham, on "M" level, by slide of rock. Leaves widow and two children.

Jacob Harsla, age 56, was killed March 20, 1919, at the



A MINE CAGE

With Properly Built Doors for the
Safety of Men While Being Hoisted.
Picture Taken at the Eagle and Blue
Bell Mine, Eureka, Utah.

Utah-Apex Mine, Bingham, by falling rock in No. 9 stope. He was climbing a short ladder, under last shots, when rock fell, crushing hip and leg. Died next day.

L. Ruston was injured March 20, 1919, at the Utah

Copper Mine, Bingham, by rolling rock from bank. Died March 25. Left widow and four children.

J. Notti was killed March 30, 1919, at the Utah Copper Mine, Bingham, by rolling rock. He was gang boss. While clearing up track, rock rolled down and struck him. Left widow and seven children.

Walter Albert Wells was killed August 30, 1919, at the Tintic Standard Mine, Eureka, by rolling rock in stope. He was knocked down against a larger rock, breaking his back.

J. A. MacVicar was killed on September 12, 1919, at the Imperial Lead Mine, Tooele County, by falling rock in a tunnel.

Harry Bulopulas, locally known as "Harry Brown," age 28, was killed September 19, 1919, at the Colorado Consolidated Mine, Eureka. He ran a car into the shaft and fell with it.

Ed Apostle, age 28, was killed October 13, 1919, at the Utah-Apex Mine by falling rock. He had worked under a slab for six hours before it fell, killing him instantly.

Alvin Jensen, age 23, was instantly killed on October 23, 1919, in the Ruby Shaft, owned by the Knight Investment Company, located near Silver City, by a loaded bucket falling upon him. The cable slipped out of the thimble.

Gorcho Estimoff, age 33, was killed November 3, 1919, at the Utah-Apex Mine, Bingham, by falling from a bucket while being lowered down the shaft. Leaves widow and one child.

John A. Murphy, age 43, was killed December 11, 1919, at the Silver King Coalition Mine, Park City, by falling into an ore chute.

1920.

Thomas R. Hicken was killed January 5, 1920, at the Iron Blossom Mine on account of wrong signals. He was carried up by a cage with a loose car of rock on it and was crushed. He leaves a wife and 1 child.

W. G. Wood was killed at the Vipont Mine, January 6, 1920, by powder smoke in a raise.

Steve Kolos was killed February 1, 1920, at the U. S. Mine, Bingham, by falling down a timber raise.

R. F. McGinty, a leaser, was killed February 23, 1920, at the Salt Lake Copper Company, near Tecoma, by falling rock. He was squatting down, picking up ore immediately under a large rock. Was warned of danger. Rock weighing one-half ton fell, crushing him. No family.

H. W. Clays, age 40, was killed March 2, 1920, at the Peruvian Mine, Alta, by a snowslide. Leaves one child.

John Howry, age 38, was killed March 2, 1920, at the Peruvian Mine, Alta, by a snowslide.

Harry Gardner and Fred Hansen, employees of the Woodlawn Mine, Big Cottonwood, were killed March 6, 1920, by a snowslide while going along the electric power line to locate the cause of the power being off. Left one widow and six children.

Chris Korofegas was killed March 7, 1920, at the Utah Copper Mine by a rock from a blast. He was sitting in his cabin, near the blast, and a rock passed through a small opening, struck him on the knee, crushing it, from which he died two weeks later.

Angelo Sabelli, age 33, was killed by being crushed by a cage in shaft March 13, 1920, at the Utah-Apex Mine. He was caught between the cage and shaft timbers. Leaves a wife and child in Italy. Confusion of signals seems to have caused the accident.

W. S. Gammon, age 47, was killed March 28, 1920, at the Utah-Apex Mine. He was cleaning the mud from a roller under a conveyor belt, when the car being used caught belt and roller and flew up and broke his neck. He leaves a wife.

John J. Haskett, age 30, was killed March 31, 1920, at the Victoria Gold Mine, Eureka. While working at the bottom of the shaft he was affected by gas. When he attempted to climb out, he fell back and broke his neck. Leaves a widow.

Swen Odgaard and Gertrude Odgaard, employed as boarding house keepers by the Wasatch Mines Company, at Alta, were killed April 5, 1920, by a snowslide which swept down the mountain and carried away the boarding house.

Stanley Cox, age 28, single, was injured on April 17, 1920, at the Ontario Mine, Park City, by being struck by a sliding rock. Died next day.

Thomas Dixon, age 21, single, was killed April 26, 1920, by a piece of rock falling down raise next to chute, from which he was drawing ore.

Jokovas Jiakoumakis was killed April 27, 1920, at the Utah-Apex Mine, Bingham, Utah, by fall of rock in stope. No family.

R. C. Livingston, age 20, was killed May 9, 1920, at the Judge Mine, Park City, by a blast, while loading a hole. The explosion seems to have been caused by tamping, although a wooden rod was being used.

Fred Phizacklea, age 36, was killed June 17, 1920, at the

U. S. Mine, Bingham, by drilling into the bottom of an old hole. He leaves a wife and six children in Bingham.

John Hakla was killed July 2, 1920, at the Daly-West Mine, Park City, by a premature blast while spitting his holes, the hole being full of powder with no tamping. It seems sparks from fuse caused it.

Three Japanese laborers—Katsuji Fukumoto, Masutaro Sudow, Nihei Ito—were killed August 13, 1920, at the Utah Copper Mine, Bingham, in a railroad collision. They were thrown from a flat car to the track and crushed by loaded ore car. Confusion of signals given as the cause. Each leaves a wife in Japan.

Walter Carr, age 23, was killed August 21, 1920, at the Judge Mine, Park City, by blast. He drilled into a missed hole. It was one of his own holes.

George Hondropholus was killed August 25, 1920, at the Montana-Bingham Mine, Bingham, by rolling rock. He was working on an ore bin; a rock was started from above by men handling timbers, rock struck him on the head. Died 5 hours later.

FATAL ACCIDENTS**Smelters.**

Wm. E. Harrison.

1919.

Sam Anest, age 32, single, was killed June 25, 1919, at the Garfield Smelter. He was crushed between car and timber when he stepped off the car.

Peter Starapolis, age 32, injured July 27, 1919, at the Midvale Smelter by fall of platform upon which he was working. Broken ribs and internal injuries. Died August 2, 1919.

Ben Brown, age 32, was fatally injured on August 6, 1919, at the Midvale Smelter, by falling from a swinging platform. Died August 8. Leaves a widow and five children.

Jim Lakis, age 28, was injured October 9, 1919, at the Murray Smelter, by falling between two railroad cars, while trying to release the dog. Died next day.

1920.

Andrew Kazas was killed July 24, 1920, at the Midvale Smelter by electrocution. He was a slag tapper but attempted to run an electric engine. He was found lying across the controller, dead.

John Lundy, age 27, was killed August 24, 1920, at the Murray Smelter by being crushed between two railroad cars. It is not known why he went between the cars. He leaves a widow and one child.

FATAL ACCIDENTS

Mills.

1919.

A. A. Perry, age 59, was killed August 12, 1919, at the Utah Copper Company, Arthur Mill. He was struck by a car while crossing the railroad track. Died on the operating table. Leaves widow and daughter.

1920.

John Henry Scott, age 23, was killed October 21, 1920, at the Knox Mill, Midvale. While oiling, his clothes were caught on a shafting. He was instantly killed by his head being crushed against a timber. He leaves a widow and child.

Elton Cook was killed February 26, 1920, by the explosion of a digester at the Alunite Mill of the Mineral Products Corporation at Marysvale. He left a wife.

Allen Hilding was killed at the same time as Elton Cook. He left a wife and four children.

FATAL ACCIDENTS

Quarries.

1920.

Albert Davis, age 28, was killed January 15, 1920, at the Florence Quarry, Payson, Utah. Struck by a rolling rock on the back of the neck. Died in 15 minutes. Leaves a wife of one week.

In studying the circumstances which result in fatalities it is sometimes difficult to determine upon where to place the responsibility. It is necessary, however, to analyze the causes and place the responsibility as nearly as possible in order to put forth intelligent efforts to prevent the occurrence of similar accidents in the future. An analysis of the accident reports, from which the above extracts were made, indicated that the responsibility rested approximately as shown in the following table.

Responsibility for fatalities in the quarries, mines, smelters and mills for 1919 and 10 months of 1920 (excluding coal mines):

	Open Pit Mines and Quarries	Under- ground Mines	Mills and Smelters
Fatalities due to conditions which could have been avoided by the companies	30%	61½%	30%
Laxness of foremen or bosses in some cases shared by the man killed		16%	
Fault of fellow employes..	40%	61½%	
Carelessness of the man killed	10%	29%	20%
Purely Accidental	20%	42%*	50%

* Includes 20% of fatalities, which were caused by snowslides.

LABOR AND ACCIDENT DATA

MINES OF UTAH OTHER THAN COAL MINES

	1916	1917	1918	1919
Average days worked per man.....	318	326	340	325
Average number of men employed:				
Underground	4,690	5,079	4,165	3,057
Open Pit	1,500	1,626	1,437	782
Surface	1,194	1,228	1,299	760
Total	7,384	7,933	6,901	4,599
Total day's labor:				
Underground	1,445,661	1,626,780	1,403,926	977,780
Open Pit	547,500	588,410	518,659	278,990
Surface	351,846	370,846	425,048	240,653
Total	2,345,007	2,586,036	2,347,633	1,497,423
Number killed:				
Underground	14	22	17	9
Open Pit	8	4	9	6
Surface	2		2	
Total	24	26	28	15
Number injured:				
Underground	1,117	1,340	1,393	891
Open Pit	1,018	698	554	165
Surface	127	347	172	109
Total	2,262	2,385	2,119	1,165

In 1919 six wives were left widows and twenty-four children left fatherless.

ACCIDENTS IN ALL MINES EXCEPT COAL OPERATED IN UTAH DURING THE YEARS 1918 AND 1919

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (time lost 1 to 14 days)	
UNDERGROUND:	1918	1919	1918	1919	1918	1919
Number killed or injured by—						
1. Fall of rock or ore from roof or wall...	2	6	111	92	222	137
2. Handling Rock or Ore:						
(a) Loading at face.....			17	9	45	25
(b) Loading at chute.....			5	7	26	21
(c) Sledging.....			3	6	21	19
3. Timber or Hand Tools.....	1		18	31	48	35
4. Explosives:						
(a) Transportation.....						
(b) Charging.....						
(c) Suffocation.....						
(d) Drilling into old holes.....			5	4	1	
(e) Striking in loose rock or ore.....			1	1	1	
(f) Thawing.....						
(g) Caps, detonators, etc.....			2		2	1
(h) Unguarded shots.....				2		
(i) Returned too soon.....				3		1
(j) Premature shot.....	3		3	1	3	1
(k) Miscellaneous.....				1	6	2
5. Haulage:						
(a) Hand and animal.....			65	33	125	101
(b) Mechanical.....			6	3	7	7
6. Persons Falling Down Chute, Winze, Raise or Stope.....	4		39	19	49	22
7. Run of Ore from Chute or Pocket.....		1	7	3	8	7
8. Drilling (by machine or hand drill).....			25	20	75	37
9. Electricity:						
(a) Direct contact with trolley wire.....			2		1	1
(b) Tool or bar striking trolley wire.....					2	
(c) Contact with motor.....				1		1
(d) Others.....			5		10	1
10. Machinery Other than 5 and 8.....	1			2		7
11. Mine Fires.....				2		1
12. Suffocation from natural gases.....				3		
13. Inrush of Water.....						
14. Nails and Splinters.....			24	11	81	39
15. Other Causes:						
(a) Falling objects other than 1, 2			10	8	29	12
(b) Flying objects, other than 2(c)...			16	12	34	16
(c) Burns.....				1	14	6
(d) Miscellaneous.....			55	38	133	41
Total number killed or injured....	11	7	459	313	980	541

**ACCIDENTS IN ALL MINES EXCEPT COAL
OPERATED IN UTAH DURING THE
YEARS 1918 AND 1919**

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (time lost, 1 to 14 days)	
SHAFT ACCIDENTS:						
Number killed or injured by—	1918	1919	1918	1919	1918	1919
16. Falling down shaft.....	1		3	2	1	3
17. Objects falling down shaft.....			3	3	3	3
18. Breaking of cables.....			3	3	1	1
19. Overwinding	1					2
20. Cage, Skip or Bucket:						
(a) Runaway	1	1	4		2	1
(b) Riding with rock or ore.....			2		1	1
(c) Riding with timber or tools					2	2
(d) Struck by		1	3	3	2	3
21. Other Causes			1	2	2	5
Total number killed or injured by shaft accidents	3	2	23	13	16	24

ACCIDENTS IN ALL MINES EXCEPT COAL OPERATED IN UTAH DURING THE YEARS 1918 AND 1919

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (time lost 1 to 14 days)	
	1918	1919	1918	1919	1918	1919
SURFACE ACCIDENTS:						
At Surface Plants and Shops—						
Number killed or injured by—						
22. Haulage:						
(a) Hand and animal			6	5	10	13
(b) Mechanical			2	1	2	3
23. Railway cars and locomotives			5	4	8	5
24. Run or fall of ore in or from ore bins			1		3	
25. Falls of persons			8	5	15	8
26. Nails and splinters			3	1	9	4
27. Hand tools, axes, bars, etc.				4		19
28. Electricity						
(a) Direct contact with trolley wire			1			1
(b) Tool or bar striking trolley wire						1
(c) Contact with motor				1		1
(d) Others				1		1
29. Machinery			4	4	14	5
30. Other Causes:						
(a) Falling objects	1		5	4	12	9
(b) Flying objects				1	8	1
(c) Burns					3	2
(d) Miscellaneous	1		1	3	8	2
Total number killed or injured by surface accidents	2		36	34	92	75

**ACCIDENTS IN ALL MINES, EXCEPT COAL,
OPERATED IN UTAH DURING THE
YEARS 1918 and 1919**

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (time lost, 1 to 14 days)	
OPEN-PIT ACCIDENTS:	1918	1919	1918	1919	1918	1919
Number Killed or Injured in Pit by—						
31. Falls or slides of rock or ore	3	4	23	7	83	29
32. Explosives:						
(a) Transportation				2		
(b) Charging					1	
(c) Suffocation			2		1	
(d) Drilling into old holes			1		1	
(e) Striking in loose rock or ore						
(f) Thawing						
(g) Caps, detonators, etc.			1		2	
(h) Unguarded shots	2	1	2	3	3	4
(i) Returned too soon		1				
(j) Premature shot			4		1	
(k) Miscellaneous					2	
33. Haulage:						
(a) Hand and animal			17	6	16	13
(b) Mechanical				2		5
(c) Railway cars and locomotives	3		9	5	11	7
34. Steam Shovel			15	9	23	12
35. Fall of persons			9	3	12	7
36. Falls of derricks, booms, etc.						
37. Runs or fall of ore in or from ore bins			2		1	
38. Machinery (other than 33 and 34)			8	1	12	2
39. Electricity:						
(a) Direct contact with trolley wire					1	
(b) Tool or bar striking trolley wire						
(c) Contact with motor						
(d) Others						
40. Hand tools			10	3	21	9
41. Other causes:						
(a) Falling objects other than 31			2	4	13	9
(b) Flying objects			4	3	19	1
(c) Burns				1		2
(d) Miscellaneous			58	3	177	5
Total number killed or injured by open-pit accidents	8	6	167	51	401	131
Grand total	24	15	685	412	1,489	753

WESTERN STATES, 1915 TO 1918

STATE	Year	UNDERGROUND										SHAFT					
		1. Fall of rock or ore from roof or wall	2. Rock or ore while working at working face	3. Timber or hand tools	4. Explosives	5. Haulage accidents	6. Falling down chute, winze, raise or slope	7. Run of ore from chute or pocket	8. Drilling accidents	9. Electricity	10. Mach., not including locomotives or drills	11. Mine fires	12. Suffocation from natural gases	13. Inrush of water	14. Stepping on nail	15. Other causes	Total underground
Utah	1915	10															10
	1916	6															6
	1917	8															8
	1918	2															2
California	1915	6															6
	1916	12															12
	1917	11															11
	1918	15															15
Colorado	1915	10			10	4	2										26
	1916	19			4	3	16										42
	1917	13			1	4	13										30
	1918	17			1	12	4										33
Idaho	1915	10															10
	1916	5															5
	1917	7															7
	1918	17															17
Montana	1915	5															5
	1916	21															21
	1917	19															19
	1918	29															29
Nevada	1915	2															2
	1916	7															7
	1917	7															7
	1918	5															5
	1915	1			1	1	1										4
	1916	2			1	1	1										5
	1917	2			1	1	1										5
	1918	2			1	1	1										5
	1915	1			1	1	1										4
	1916	2			1	1	1										5
	1917	2			1	1	1										5
	1918	2			1	1	1										5
	1915	1			1	1	1										4
	1916	2			1	1	1										5
	1917	2			1	1	1										5
	1918	2			1	1	1										5
	1915	1			1	1	1										4
	1916	2			1	1	1										5
	1917	2			1	1	1										5
	1918	2			1	1	1										5
	1915	1			1	1	1										4
	1916	2			1	1	1										5
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	1915	1			1	1	1										4
	1916	2			1	1	1										5
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	1915	1			1	1	1										4
	1916	2			1	1	1										5
	1917	2			1	1	1										5
	1918	2			1	1	1										5
	1915	1			1	1	1										4
	1916	2			1	1	1			</							

TABLE SHOWING FATALITIES IN THE METAL MINES OF UTAH AND SOME OTHER WESTERN STATES 1915 TO 1918—(Continued)

STATE	Year	SURFACE											OPEN PIT											Grand total
		22. Mine cars, mine locomotives, or aerial trams	23. Railway cars and locomotives	24. Run or fall of ore in or from ore bin	25. Falls of persons	26. Stepping on nails	27. Hand tools, axes, bars, etc.	28. Electricity	29. Machinery	30. Other causes	Total surface	31. Falls or slides of rock or ore	32. Explosives	33. Haulage accidents, locomotives, etc.	34. Steam shovels	35. Falls of persons	36. Falls of derricks, booms, etc.	37. Run or fall of ore in or from ore bin	38. Mach., other than locomotives or steam shovels	39. Electricity	40. Hand tools	41. Other causes	Total open pit	
Utah	1915																							23
	1916																							24
	1917																							26
	1918																							28
California	1915																							15
	1916																							15
	1917																							49
	1918																							44
Colorado	1915																							41
	1916																							44
	1917																							47
	1918																							47
MONTANA	1915																							25
	1916																							25
	1917																							47
	1918																							47
MONTANA	1915																							17
	1916																							15
	1917																							24
	1918																							17
Montana	1915																							62
	1916																							75
	1917																							21
	1918																							64
Nevada	1915																							30
	1916																							18
	1917																							31
	1918																							31
Nevada	1915																							33
	1916																							33
	1917																							33
	1918																							33

WESTERN STATES 1915 TO 1918—(Continued)

STATE	Year	Actual Number of Men Employed		Average No. of days mines operated	Total days of labor performed	Fatalities per 1000 Workers (300,000 shifts)	
		Underground	Surface			Underground and shaft	Total
Utah	1915	3,214	2,235	335	1,895,854	4.46	3.78
	1916	4,690	2,694	318	2,345,007	2.92	3.07
	1917	5,079	2,854	326	2,586,096	3.30	3.02
	1918	4,165	2,736	340	2,347,693	3.29	3.28
California	1915	3,057	7,600	325	1,497,423	2.76	3.00
	1916	6,271	4,143	304	3,163,407	5.38	4.65
	1917	7,879	5,416	283	3,768,322	4.84	3.84
	1918	6,100	4,023	338	3,417,101	5.38	3.86
Colorado	1915	5,203	4,547	300	2,925,110	8.46	5.54
	1916	4,702	1,667	303	1,930,586	9.69	7.61
	1917	9,008	1,112	320	3,236,196	5.52	5.84
	1918	6,793	756	300	2,264,883	6.47	6.23
Idaho	1915	3,860	1,330	267	1,386,965	4.89	4.63
	1916	4,460	1,614	261	1,585,121	6.69	5.41
	1917	4,328	1,802	271	1,662,271	4.86	4.33
	1918	3,166	1,298	278	1,241,089	4.77	4.11
Montana	1915	10,809	3,037	296	4,103,700	3.84	4.53
	1916	15,086	4,405	297	5,793,114	4.62	3.88
	1917	14,420	1,844	299	4,865,567	14.61	13.20
	1918	15,903	1,955	307	5,479,838	3.74	3.50
Nevada	1915	3,347	2,366	302	1,726,012	4.14	3.13
	1916	5,222	2,731	274	2,181,188	5.25	4.13
	1917	4,530	2,325	300	2,059,054	5.07	4.52
	1918	3,382	2,307	360	2,047,980	7.39	4.83
Whole United States	1915						3.89
	1916						3.62
	1917						4.44
	1918						3.57

INSPECTION WORK AND ACCIDENT AND LABOR DATA IN THE COAL MINES OF UTAH

Previous to the passage of the Workmen's Compensation Law, Utah had had a coal mine inspector since 1896 and also had a brief set of coal mining laws. The conditions in the coal mines of the State, from a safety standpoint, compare favorably with other coal producing states of the Union but the fatality rate has been much higher than the average for the whole United States. The average height of the coal seams worked in this State is higher than in any other state, which would probably explain a higher fatality rate, due to falls of roof or top coal, but a careful study of the causes of the fatalities shows that too large a number of deaths have occurred from other causes, such as haulage, electricity, and surface accidents.

In 1920, having had the benefit of a number of months of experience with the metal mine safety orders, the question of applying additional safety regulations to the coal mines arose. Utah's coal mining law was very brief but it had been quite effective. It was realized that it was too brief because many conditions, such as the use of electrical equipment, methods of blasting, the maintenance of rescue apparatus and many other things were either omitted or only slightly covered. However, these matters could have been left to the separate orders of the coal mine inspector had it not been for the demands which any workmen's compensation act places upon the physical conditions of the mines. The principal of these is the fact that compensation insurance rates are based on the number of accidents that have happened, also on the conditions at the mines which might permit others to occur.

In considering the preparation of new coal mine laws or safety orders we were, therefore, influenced by the following conditions:

First, the briefness and age of the old law.

Second, the fact that the insurance companies demand good physical conditions at the mines or they will charge high rates.

Third, that public sentiment demands very careful consideration looking toward the welfare of the workmen and these demands from the public will probably become more insistent.

After it had been decided to adopt additional safety regulations for the coal mines, the question of whether to make them specific and detailed enough to include many minor matters or whether to cover only the larger conditions and leave the rest to the judgment of the inspector was the most difficult problem to solve. It was finally decided to make them specific for the following reasons:

First, every inspector has different ideas regarding a good many practices and a change of inspector would work a hardship on the operators if they required changes to comply with their individual ideas. In other words, the regulations would serve as a guide to the inspectors.

Second, as far as possible each mine should adopt such methods and devices as have proved safest under the given conditions; that is, the methods and practices should be standardized as far as possible.

Third, carelessness in small things frequently is the cause of injury, and added protection to the workmen is secured by doing them in the right way.

Fourth, the old-time Scotch or English miner learned all the details of safe mining from experienced ancestors and served an apprenticeship that gave him an excellent education regarding the right and wrong way of doing his work, but many men in the mine today, both officials and miners, have served no such apprenticeship and consequently any set of safety regulations that covers many details of operation will serve as a book of instructions for them.

Fifth, not only the larger conditions but the smaller conditions are taken into consideration by the insurance companies in arriving at their rates. And last, but not least, we wanted to be able to say to the miners, "We have required the operators to make their mines safe in every possible way, now you must do your part." This does not mean that all the requirements are for the operator. The miner is given some strict rules, but, naturally, most of the regulations govern operating conditions.

Most of the coal mining companies of Utah have adopted for their own use much more stringent rules than were required by the State law. Mr. Sharp, of the U. S. Fuel Company, and Mr. Williams, of the Utah Fuel Company, were pioneers in a number of things helping to safeguard the men. In preparing a tentative draft of State regula-

tions, full advantage was taken of the combined experience of the operators of the State and also we were benefited by the regulations of the companies writing compensation insurance. After the tentative draft was adopted, it was thoroughly discussed and revised by a committee of coal mine operators, consisting of:

Mr. R. M. Magraw, General Superintendent of the U. S. Fuel Co.

Mr. A. C. Watts, Chief Engineer for the Utah Fuel Co.

Mr. Frank Cameron, General Manager of the Liberty Fuel Co.

Mr. William Monay, Manager of the Kinney Coal Co.

Mr. J. H. Martin, General Manager of the Scofield Coal Co.

Mr. Leonard Wilson, Consulting Electrical Engineer, and Messrs. H. T. Plumb and F. A. Rank, engineers with the General Electric Company, also assisted in preparing the electrical provisions of the Orders.

After these men had passed upon the regulations we felt assured that they were practical as well as effective. In fact, we feel that Utah's regulations, as they have now been adopted, could serve as a model for any state which desires to revise its laws to meet the new demands imposed upon the industry by workmen's compensation acts.

As before stated, one of the principal reasons for issuing specific regulations to the operators was in order that we might go to the workman with clean hands. We recognized that the best way to reduce accidents is to educate the workmen to be careful. It was felt that the best results would come from inculcating a spirit of safety among the men and we wanted to have the slate clear first, as far as the operators were concerned, and we also wanted to have rules for the men in such shape that we could, to a certain extent, by force of law, make the wilfully careless man take care of himself.

While we are wont to make the statement that most fatalities are due to the carelessness of the men and our tendency is to criticize the present-day miner quite severely, I believe that we make a serious error when we make a blanket accusation against all miners as a group. Our experience has been that a certain per cent, probably more than half, of the miners are good, conscientious workmen and are looking out for their own safety to the best of their ability. The remainder, however, are men who are thinking only of loading another carload of coal and are putting the

dollar to be earned ahead of their own safety or the safety of their fellow workers. Many of these men are "money mad" and their only desire is to make as much as possible with as little effort as possible.

However, if we assume that the men are responsible for many unsafe conditions that they might correct, yet due to the fact that workmen's compensation laws make every accident a burden on the industry, as a whole, we must place the responsibility on the mine officials of insisting that the men keep their working conditions safe. It not infrequently happens that a foreman or fire boss simply suggests to the miner that he put up a prop, instead of insisting that it be done and done at once. In other words, the first way to educate the miner is by strict discipline and we believe that if the mine foreman or fire boss allows men to work in an unsafe place it warrants a consideration of cancelling his certificate.

Under present conditions, the mine bosses are seriously handicapped in maintaining discipline because if a man is discharged it is no punishment, on account of work being so plentiful. We have therefore, in our regulations, provided a number of rules for the men and the original statute requires them to obey orders and do everything else reasonably necessary to preserve their own safety and we believe that if any workman refuses to do these things that he should be prosecuted the same as he would be for any other offense against public policy.

Having provided these means of forcing the careless worker to change his ways, the only other method that can be applied is that of education. The efforts that will be put forth in this direction are explained under the heading of welfare work.



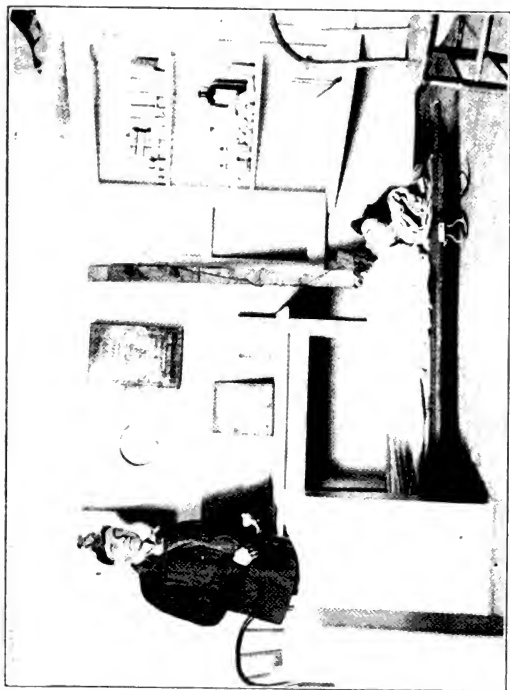
A STEEL MINE CAR

**U. S. Fuel Company. In Addition to the Safety on the
Coupling Pin Nearly All Coal Mine Cars in
Utah Have Safety Chains on Both
Sides of the Cars.**



PROPERLY BARRICADED POWDER MAGAZINE

Hiawatha Mine in the U. S. Fuel Company.



AN EMERGENCY FIRST-AID ROOM
One and One-Quarter Miles Underground, Castle Gate No. 1 Mine of the Utah
Fuel Company

**SUMMARY OF FATAL ACCIDENTS WHICH OCCURRED
IN THE COAL MINES OF UTAH SINCE I WAS
APPOINTED COAL MINE INSPECTOR**

By John Crawford.

Christobol Martinez, a Mexican, 27 years old and single, was killed August 11, 1918, No. 1 Storrs Mine, by being caught by picks of chain of the mining machine. Accident was caused by slipping of jack pipe while he was holding it, causing him to lose his balance and his foot was caught in the picks of the mining machine.

Tom Kruzich, an Austrian, 23 years old and single, was killed August 30, 1918, Standardville Mine, while pulling the pin, horse turned around suddenly and he was caught between the car and shafts. He walked home by himself and died 11 hours later.

Alger Larsen Skain, a Norwegian, 38 years old and single, was killed September 9, 1918, Clear Creek Mine, by fall of slate while in the act of drilling hole. Caused by a smooth slip unobserved until after the accident.

H. B. Stevens, an American, 19 years old and single, was injured October 14, 1918, Clear Creek Mine. He was working nights and the mine foreman told him that he wanted him to sprinkle the mine. The young man went after the hose and on one of the double partings he saw a motor standing there. He got on it and loosened the brakes and started down a 3 per cent grade. He got excited and forgot how to apply the brakes. After running down the entry for 1,500 feet the motor ditched on a curve and the young man's leg was crushed between the motor and the lower rib of the entry. He died from his injuries two days later.

Henry P. Bjarnson, an American, 16 years old and single, was killed October 19, 1918, Scofield Mine, by being caught by a fall of coal while loading a car with his older brother, who was his partner.

Y. Yoshimoto, a Japanese, was killed November 4, 1918, Hiawatha No. 1 Mine. This miner went back into his pillar after the props had been pulled out. He started to relay the track that had been taken out before the props were pulled; and while working on the track a slab of rock,

8 feet wide, 20 feet long and 11 inches thick, fell from the roof, killing him instantly.

Roy Monroe, an American, 29 years old and married, leaves a wife and four minor children. He was killed November 19, 1918, Hiawatha Mine Tramway, by coming in contact with signal wires carrying 230 volts. He met his brother, who was coming down the tramway, while he was going up, and in going to speak to him he turned around, stepped on the rail and at the same time took hold of the signal wires and before his brother could liberate him he was dead.

Kazuto Hatai, a Japanese, age 27 years, single, was killed November 28, 1918, Spring Canyon No. 3 Mine, by a chunk of coal falling from the roof, which weighed about 25 pounds; it struck him on the head and dislocated his neck. He was brushing out the bottom coal.

Clyde McClanahan, an American, married, leaves a wife and one child, was injured December 19, 1918, Wattis Mine, by a slab of coal rolling over him, which he had shot down the night before. He was loading a car in front of this piece of coal, which measured 7 feet long, 3 feet wide and 2 feet thick, when all of a sudden it rolled over and caught him between the end of the car and the chunk of coal, injuring him so seriously that he died January 22, 1919, at the St. Mark's Hospital.

Jefferson Bradley, an American, 35 years old and married, leaves a wife and 5 children, was killed January 8, 1919, on the tramway of the Storrs Mine, by being run over by an empty trip of cars. The rope was off the rollers and while he was trying to put it on he did not observe the empty trip until he was struck by the cars and thrown under the trip. He died 15 minutes after the accident.

Fred Young, an American, 27 years old and married, leaves a wife and one child, was fatally injured January 14, 1919, Sunnyside No. 2 Mine, by falling under a trip of loaded cars. While trying to get on the trip his foot slipped and threw him under the cars and dragged him 397 feet before he let loose. The last car passed over his leg and crushed it so that it had to be amputated, from which he died in the St. Mark's Hospital, Salt Lake City, January 18, 1919.

K. Yamada, a Japanese, 31 years old and married, leaves a wife and no children, was killed January 15, 1919, Carbon Fuel Company. Yamada was helping on a machine, he was told by the machine runner to go and sand the rails in the next room so that when the place they were working in was finished they could go into it and cut it also. Yamada

came back and got into where the machine was running, when all of a sudden the top coal caved on top of him, killing him instantly. The machine runner was warned by the fire boss not to work under that top coal as it was dangerous. The machine man, T. Wakia, looked around and said that he had cut worse places than this, hence the accident.

William Burton, an American, 41 years old and married, has a wife and 5 children and another child about to be born, was killed January 20, 1919, Spring Canyon Coal Company. He was instantly killed by being run over by a D. & R. G. box car that was being pushed in by the switch engine, the tippie was running off coal at the time causing a noise so that Burton did not hear the engine when he made to cross over the track under the tippie.

Antonia Asdrobolini, an Italian, 44 years old and married, has a wife and four children in Italy, and Steve Curcich, Serbian, single, were killed February 10, 1919, Mohrland Mine. Antonio Asdrobolini and Steve Curcich were partners and were working in No. 10 room. They had their last car of coal and told the driver that they would not need any more cars that day. They started to work on their track and while doing so were both instantly killed by a fall of coal from the rib of pillar between rooms 9 and 10. The fall of coal also knocked out 3 props that were set about 2 feet from the lip of top coal. These also fell on top of them.

E. Acroterianakis, a Greek, was killed March 7, 1919, Winter Quarters Mine, by a bounce which occurred in No. 1 room on the fifth level of the 11 raise. A rock fell on him weighing about 2 tons, which killed him instantly. This place had been inspected by the fire boss about 45 minutes before the accident and found to be in good condition, except for a prop that was needed on the right hand side, which he told them to put up but they neglected to do so.

Nick Colis, a Greek, 27 years old and single, was killed March 17, 1919, Kenilworth Mine. He was cleaning up bottom coal when the top coal caved on him, killing him instantly. The coal measured $6\frac{1}{2}$ feet, $4\frac{1}{2}$ feet wide and $7\frac{1}{2}$ feet long.

John Simons, an Austrian, 52 years old and single, was injured April 6, 1919, Utah Mine, by fall of slate. He drilled and tamped two shots, one on the top and one on the bottom. He fired the top shot first and went back into his place to light the bottom one, and was stooped over in the act of lighting it, when the slate fell upon him.

Thomas Forester, an Englishman, 28 years old and married, leaves a wife and no children, was killed June 8, 1919, Castle Gate No. 1 Mine tippie. He was employed as chief electrician and was moving an electric Jeffrey locomotive from the motor barn across the bridge at the tippie. One of the cross beams on the bridge broke and the motor fell down to the ground, a distance of 22 feet, with Mr. Forester under it. He was killed instantly.

Louis Dakovich, an Austrian, 41 years old and married, leaves a wife and 3 children, who reside in Austria, was killed June 28, 1919, Hiawatha No. 2 Mine, while loading a car, by fall of coal caused by a bounce on the pillars.

Louis Kerkos, a Greek, 27 years old and single, was killed July 11, 1919, Castle Gate Mine, by fall of rock caused by bounce on pillars.

Mike Tsoouroupakis, naturalized Greek, 24 years old and single, was killed July 17, 1919, Winter Quarters Mine, while employed as a machine helper. He was holding the jack pipe which slipped, on account of not being sunk deep enough in the top coal. He was caught in the chain picks of the mining machine.

George Gardner, an American, 30 years old and married, leaves a wife and one dependent child, who reside at Clear Creek, Utah. He was fatally injured July 28, 1919, and died July 31, 1919, Clear Creek Mine, from injuries received by being caught between the car and shafts. He missed getting his sprags in and tried to pull the pin to liberate the horse from the car, when the horse turned suddenly and caught him between the shafts and car.

James Moore, an American, leaves a wife and one child, who reside at Heiner, Utah. He was fatally injured August 11, 1919, Panther Mine. He was holding the jack pipe when it slipped, on account of the hole in the roof to hold pipe was only $\frac{1}{2}$ inch. He lost his balance and put his foot on the cutter bar and the picks caught the bottom of his loose overalls. He was dragged into the machine and had his left leg and arm crushed so bad that Dr. McDermaid had to amputate them.

Mark Menotti, a naturalized Italian, 28 years old and single, was killed August 15, 1919, Sunnyside No. 1 Mine, by being caught on the chain pick of the mining machine. Caused by the jack pipe slipping and over balancing him so that his left foot was caught on the machine picks, also ripped the body up to the shoulder. The left leg was entirely taken off.

Ichigoro Nozumi, a Japanese, 42 years old and single, was instantly killed August 16, 1919, Kenilworth No. 2

Mine. While riding in a three-car trip of empty cars pulled by a horse, he got between the cars and attempted to get out and was caught between the rib and the car and was crushed to death.

S. E. Long, an American, 24 years old and married, leaves a wife and three children, who reside at Winter Quarters Mine, by a chunk of coal 3 feet long, 2 feet wide and 18 inches thick, which tapered to 4 inches, fell on his head and dislocated his neck. The coal fell from a slip which was unobserved until after the accident.

Mike Babionitackis, a Greek, 50 years old and single, was fatally injured September 11, 1919, and died September 18, 1919, Standard Mine. He lit a shot which missed fire. He then went back and took out some of the tamping but did not pull out the powder, then he reloaded the hole with new powder and tamped it. After the shot went off he went back to see what it had done. When about 5 minutes later the powder that he put in the hole in the first place went off. He was injured and burned so severely that he died from the effects of the explosion.

Christ Bozas, a Greek, 34 years old and single, was instantly killed October 13, 1919, Wattis Mine, by jumping off an empty trip that was going at a great speed; when he jumped off he fell against a rock which fractured his skull. He died a few minutes later.

Richard Dark, an American, 40 years old and single, was killed October 21, 1919, Kenilworth Mine No. 1, by being struck by a slab of coal 8 inches thick, 8 feet long and $4\frac{1}{2}$ feet wide, which tapered down to $\frac{1}{4}$ inch on the outer edge, which broke off close by one of the props while he was removing track from entry stope. He was instantly killed.

Mike Carvounis, a Greek, 40 years old and married, leaves a wife and three minor children, was killed October 30, 1919, Clear Creek No. 1 Mine, by a fall of top coal while loading his car.

James Wilde, an American, 34 years old and married, wife dead, leaves five minor children, who reside with their grandfather, Wm. S. Wilde, at Clear Creek, Utah, and Chas. Blackham, an American, 29 years old and married, leaves a wife and four children, who reside at Clear Creek, Utah, were killed November 26, 1919, Clear Creek No. 4 Mine, by a fall of rock which they had tried to take down but could not. They started to work under it when all of a sudden it fell, striking them both and killing them instantly.

Manus Frangudakis, a Greek, 40 years old and single,

was killed December 2, 1919, Sunnyside No. 2 Mine, by a fall of cap rock, 7 feet wide, 9 feet long and 14 inches thick. He was loading a car. His partner had set a prop and Manus was making room for another prop to be set, when all of a sudden the cap rock threw the props out and fell on him, killing him instantly.

Chas. Johnson, a Finlander, 61 years old and single, was burned by gas October 13, 1919, and died of these burns December 8, 1919, at the St. Mark's Hospital. He was warned in the morning by the fire boss not to go in his place as there was gas in it. He paid no attention to the fire boss and went into his place and set off the gas which burned him severely, from the effects of which he died December 8, 1919.

John Marcovich, an Austrian, 25 years old and single, was injured December 30, 1919, Sunnyside No. 1 Mine. He was pulling props preparing to brush roof, when all of a sudden a piece of top coal fell and struck and injured him so severely that he died January 7, 1920, St. Mark's Hospital.

1920.

Burdell Anderson, an American, 21 years old, married, leaves a wife and child, who reside at Eureka, Utah, was killed January 5, 1920, Sego Mine. He was killed by being run over with a loaded car after he had pulled the pin from the gun, which liberated the horse from the gun. He was found under the car. His neck and right leg were broken.

Tony Kelakis, a Greek, 36 years old and single, was killed January 13, 1920, Clear Creek No. 3 Mine. Tony had fired two shots on the side of his pillar and was taking down the loose coal, when all of a sudden the cap rock or drawslate caved on him. The slate was 34 feet long, 29 feet wide and 4 feet 2 inches thick. Tony was instantly killed. A slip which was on the right hand side of the place, 30 feet long, was not observed until after the accident, as the place was propped in good order.

John Hajianis, a Greek, 36 years old and single, was killed January 30, 1920, Black Hawk Mine. He was holding the jack pipe when it slipped which overbalanced him and he was caught by the picks on the chain of the mining machine. His left leg was crushed by being pulled into the machine. He died 20 minutes after the accident.

James Bonterakis, a Greek, 26 years old and single, was killed February 7, 1920, Castle Gate No. 1 Mine. He was riding rope on the second raise and was dropping a trip into the main west entry and thinking that the switch was

lined up for the entry he walked down the dip entry and as switch was lined up for the dip entry, instead of going in the west entry. The trip caught him and he was thrown under the third car of the trip and when found he was dead.

K. Okuji, a Japanese, 33 years old and single, was killed February 7, 1920, Mohrland Mine. His working place was 16 feet high, the top coal was shot down clear to the top. The top coal was farther in than the bottom. He was loading a car when the loose coal began to slide. Okuji stepped back and at the same time a piece of coal rolled from the top of the loose coal and struck him, throwing him against the car and fracturing his skull. He was instantly killed.

Angelo Ketros, a Greek, single, was killed February 9, 1920, Clear Creek No. 1 Mine. He was working in a pillar and had broken through to the adjoining room. This coal he was cleaning up, when a chunk of rock 6 feet square and about 18 inches thick, caved about 15 feet in the room they had holes into. This chunk of rock rolled over on the top of the loose coal and struck him, killing him instantly.

Bernie Larimor, an American, 18 years old and single, was killed February 16, 1920, Liberty Fuel Company, by being run over by car. He was a driver and in coming onto the parting he was riding on the front end of the car and was holding on to a chunk of coal, with his right hand, which broke when he pulled the pin out of the gun to liberate the horse from the car. He fell in front of the car which ran over him injuring him so that he died 6 hours later.

Orson A. Arnold, an American, 40 years old and married, leaves a wife and four minor children (Mrs. Arnold is also expecting another child), was killed February 19, 1920, Wasatch Mine, by being electrocuted. He was killed by taking hold of a live wire that carried 220 volts, but through a short circuit in the transformer this wire was carrying 11,000 volts.

S. Ochi, a Japanese, 43 years old (divorced), was killed February 26, 1920, Hiawatha No. 1 Mine, by fall of coal. He was loading a car of coal, when all of a sudden a piece or chunk of coal fell from the left side corner of the pillar, striking him on the head and killing him instantly.

Luigi Silvestri, an Italian, 23 years old and single, was killed May 28, 1920, Hiawatha No. 1 Mine, by fall of coal. He was pulling a spike from an old tie and was bent over resting on his knees when a chunk of coal, 5 feet long, 2 feet 4 inches wide and 2 feet thick at the top and tapering down

to a feather edge at the bottom, fell without giving any warning, striking Silvestri on the back, dislocating it. He died about 2 hours later. A circular wet slip, 5 feet long, 2 feet 8 inches wide, was the cause of this coal falling off the corner of the crosscut without giving any warning.

Bernel Frances Decker, an American, 28 years old, was killed May 31, 1920, Liberty Mine, by being suffocated by fumes of powder smoke. He was working in a tunnel and had spit a round of 16 holes. All the shots went off except one. This was just as they were coming off their shifts. He told the other men to go home and he would go back and spit the shot that had missed. The men went home and about 15 minutes later they heard a shot go off. The contractor, Mr. Gibson, got out of bed when he heard the one shot go off. He went into the mine or tunnel and found Mr. Decker dead. He was about 42 feet back from the face of the tunnel.

Orvin Rich, an American, 21 years old and married, leaves a wife and no children, was killed June 14, 1920, Rains Mine, by an electric shock. Unknown to anyone he got on top of the roof of the conveyor with a pinch bar in his hand, the bar came in contact with an electric wire that ran over the top of the roof of the conveyor, which carried 6,600 volts. Rich died about 6 hours after the accident.

Tony Galanis, a Greek, 38 years old and single, was killed June 15, 1920, Sunnyside No. 2 Mine, by a fall of rock caused by a bounce. Tony and his partner, Chas. Bikakis, were setting a prop. While his partner was putting the cap pieces on the top of the prop Tony held it, when without any warning the roof gave a bounce which threw out two props also the one they were setting. The roof caved and a chunk of it 9 feet wide, 12 feet long and 4 feet thick, fell on Tony, killing him instantly and injuring his partner.

Jim Paloni, an Italian, 34 years old and married, leaves a wife and one son, was killed July 16, 1920, Sunnyside No. 2 Mine. Killed by being run over by trip. He was working on the track tamping ties on the new parting the fifth left raise. The rope rider run his trip in and lifted out three empty cars and took them to 5th right which is 50 feet above the left raise. The rope rider then pulled out a trip of 12 loaded cars from the 5th right raise and started them down the track, but instead of going down the raise they run into the 5th left switch because the rope rider had not thrown the switch for the straight track when he pulled out the empty cars. The trip struck Jim while he was tamping ties on loaded track on the parting. He was dragged

34 feet on the rail before the trip stopped. He died before he got to the hospital.

Wm. McDermaid, an American, 38 years old and married, leaves a wife and 8 children, was killed July 22, 1920, Hiawatha No. 1 Mine, by a fall of rock. Wm. McDermaid and his brother, Dick, were pulling back the chain pillars off second west entry. On July 12, 1920 (about 1:45 P. M.) while they were loading their ninth car of coal a slab of slate, $3\frac{1}{2}$ feet long, $2\frac{1}{2}$ feet wide and 10 inches thick, fell from the roof and struck Wm. McDermaid, killing him instantly. Just previous to the accident he had set a prop which was thrown out when the slate caved down. The reason for the prop being thrown out was because the slate had broken just inside of the cap piece on the prop when the top sandrock had started to break, which always occurs before it caves in on pillar work.

Victor Hakkinen, a Finlander, 35 years old and married, leaves a wife and two children, was fatally injured July 23, 1920, Hiawatha No. 1 Mine, by fall of coal. Victor was taking down loose top coal that had been shot the night before, when all of a sudden it fell on top of him breaking his back. He died at the St. Mark's Hospital July 24, 1920.

John Apostalakis, a Greek, 28 years old and single, was killed August 14, 1920, No. 1 Hiawatha Mine, by a fall of top coal in gob. While he was sawing a prop to replace another one which had broken, the lip of the coal suddenly broke off close to the end of the cap pieces that were set on three props which were set under the top coal fell, instantly killing Apostalakis and seriously injuring Mike Stambalkis, who was standing on the right side of the car speaking to John Apostalakis.

Andrew Faure, a naturalized Frechman, 41 years old and single, was killed August 19, 1920, at the Black Hawk Mine, by being struck by a loaded trip while walking down the incline. Employees were forbidden to walk this incline and there were five signs warning them to keep off of it.

Homer Peacock, an American, 28 years old and married, (divorced) leaves two children who reside with their mother, was killed August 25, 1920, Panther Mine, by being caught between the car and the rib. He was driving on second east entry, the grade was about 2 or 4 per cent in favor of the loaded cars. At place where accident occurred he had no sprags in his cars and it appears that horse turned out when he came to a place in the entry where it was 15 feet wide, but where Homer was found the entry was 11 feet

wide. His breast was crushed between the corner of the shaft and the rib. His left foot had been caught by the gun the horse turned around. He and the horse were instantly killed.

Frank Germann, a German, 41 years old and single, was killed August 20, 1920, Peerless Mine, by fall of slate. Frank Germann and his partner, John Selan, had finished cutting crosscut from west main to back entry and had pulled out mining machine to move to another part of the mine. They were ready to load the machine on the truck when John Selan stepped back to relight his lamp with carbide and while doing so he heard the roof crack and shouted to Frank to look out. Frank stepped from the crosscut in toward entry face, when suddenly a piece of slate 3 feet long, 2 feet wide and 4 feet thick, which tapered to $\frac{1}{2}$ inch around the edge, fell striking Frank on the head and killing him instantly. The slate dropped in between two crossbars of timber that were set $5\frac{1}{2}$ feet apart and 12 feet wide, 6 feet high and timbered within 25 feet of the entry.

Nick Del Duke, an Italian, 57 years old and married, leaves a wife and two sons, was killed September 13, 1920, Liberty Mine, by being electrocuted. Nick Del Duke and two other men were grading upon the lower side of the transformers, outside the mine, when all of a sudden deceased laid down his shovel and went up to the upper side of the transformers. In some unknown way he came in contact with insulated wires that were carrying 11,000 volts into the transformers and was instantly killed. There was a two-wire temporary fence around the transformers, which was 7 feet wide, 14 feet long with two barbed wires, one wire 2 feet from the ground and the other 4 feet from the ground. The wires he came in contact with were 6 feet above the ground and over 2 feet inside the temporary wire fence.

Mike Tziblakis, a Greek, 31 years old and single, was killed September 27, 1920, Clear Creek No. 3 Mine, by being run over by trip. Mike while coming out from his work on the first south entry seeing a motor coming stepped into a crosscut, which was 10 feet wide, 6 feet high. At this crosscut on the opposite side it was 6 feet wide from the rail to the side of the entry. The motor was in front of 7 empty cars. At No. 6 room the motor was uncoupled from the empty cars so that it could be switched into No. 6 room so that the cars could coast down by themselves past No. 7 switch, then the motor ran out of No. 7 switch onto the main track and pushed the cars in front of it to the

big parting, when the motorman passed Mike he told him to look out for the empty cars and just then Mike stepped on the track and was knocked down and dragged 24 feet before the trip stopped. His back was broken. He died 15 minutes after the accident.

Frank Bluck, a Luthanian, 39 years old and single, was killed October 12, 1920, Clear Creek No. 3 Mine, by fall of rock and coal. Frank Bluck was just starting to work after eating his dinner when all of a sudden a slab, 8 feet 6 inches high, fell off the right side of pillar striking Bluck and knocking him down. A second later a chunk of slate fell from above where the coal fell off also falling on Bluck, killing him instantly. The slate measured 5 feet long, 2 feet wide and 1 foot 2 inches thick, tapering out to a feather edge. The place where the accident occurred was 12 feet 7 inches wide, 15 feet 6 inches high. This place should have been timbered before allowing men to work in it. Wm. A. Chase and J. A. Totten had the contract for grading the hoist road. Frank Bluck was working for them but had been hired as a miner by the acting Superintendent, Wm. A. Shaw.

Mike Stamblakis, a Greek, 35 years old and married, leaves a wife and two daughters, who reside at Hiawatha, Utah, was fatally injured August 14, 1920, and died October 10, 1920. He had worked 7 months in No. 1 Mine, Hiawatha. He was injured while visiting John Apostalakis, who was killed by top coal falling upon him. Some of the coal rolled over striking Mike and throwing him against a car breaking his legs, also fractured at spinal junction.

Tom Canelos, a Greek, 33 years old and single, was killed October 14, 1920, Castle Gate No. 1 Mine, was killed by a bounce. Tom Canelos and his partner, George Callas, had loaded two mine cars of coal and were waiting for the driver to pull them out, when without any warning, a bounce came on the pillar throwing out a large amount of coal from the pillar, also throwing out the crossbars and props and caving slate, which was about 4 feet thick, burying the two miners with props, coal and slate. Tom Canelos was instantly killed by the slate falling on top of him. George Callas was rescued by the Mine Foreman, George Wilson, Santo Fendo, and Charles Mandryth two and one-half hours later. These brave men showed their courage in risking their own lives to save the life of a fellow workman.

James Clintus, a Greek, 32 years old and single, was killed October 21, 1920, Mohrland Mine. Jim and his partner were loading two cars on the right hand side of the place. Jim moved around to the left hand side so that he

could chunk his car. He started to pull car from among the loose coal that was lying on the floor. The pulling out of a chunk caused a movement of the loose coal which was against a slab of loose coal on the rib, causing this slab to roll over striking Jim on the head and killing him instantly. The coal slab that rolled over was 11 feet 6 inches high 6 feet wide and 2 feet 3 inches thick.

Charles Rigby, an American, 42 years old and married, was injured October 22, 1920, and died October 31, 1920, Clear Creek Mine No. 3. He was driving close behind another trip. First trip stopped and Rigby's horse ran into first trip causing Rigby to be caught between the car and the shafts. He was taken to the St. Mark's Hospital. His injuries were so serious that he died October 31, 1920.

C. W. Allred, an American, 26 years old and single, was killed October 23, 1920, Black Hawk Mine, by a fall of rock 5 feet wide, 7 feet 4 inches long and from 3 to 5 inches thick, thinning out to $\frac{3}{8}$ inch. He and his partner knew the day before the accident that this rock was loose and had figured out that when their shots went off to bring down the top coal it would also bring down the rock. On the morning of the accident there was 6 feet of loose coal under this loose rock. They took down the loose coal and when they heard the motorman coming with an empty car for them they started to clean the loose coal off the track, when all of a sudden the rock fell striking Allred and injuring him so seriously that he died two hours after the accident.

The writer believes that in coal mining, or any other kind of mining, the time will never come when accidents will be entirely eliminated, because there are so many dangers that cannot be seen until after the accident occurs. On the other hand, accidents can be minimized by always being on the lookout for dangers and by applying the rule of "Safety First," which is simply for a man always to take care of himself. A miner should also always try to protect and warn his fellow worker of danger.

Of the four fatal accidents that occurred outside of the mines there were no unseen hazards connected with them. They all could have been avoided if the rule of safety had been thoroughly carried out.

There is little excuse for a miner that allows loose coal to fall on him, because it is his specific business to pull down all loose coal and make his working place safe.

A miner can be deceived by sounding a rock roof with his pick because when rock or slate has a smooth slip around it, such as is sometimes called a "horse-back," it may not

give any sound of being loose when tested by the miner. Sometimes rocks are in the shape of a pot or boulder and show no signs of being loose until after they fall out of the roof. These are some of the unseen hazards that the miner has to contend with and which have been the cause of many of the unavoidable accidents.

It is frequently difficult to place the responsibility for an accident and different persons would not always agree as to just where the blame should lie. We can, however, place the blame for some of them, and in the following table I have endeavored to show where, in my judgment, the responsibility should be placed for the fatalities which have been briefly mentioned above.

Fault of the man who was killed.....	39%
Due to conditions which could have been avoided by the company.....	9%
Fault of fellow employee.....	11%
Purely accidental	41%



A WORKMAN'S COTTAGE AT SUNNYSIDE, UTAH

**Utah Ranks Second to Not a State in the Union
in the High Standard of Her Coal Camps.**



WORK AND CHANGE HOUSE

Sunnyside, Utah

FATALITIES IN COAL MINES OF UTAH

1892 to 1919 by Causes.

KILLED UNDERGROUND:	1892 to 1913	1914	1915	1916	1917	1918	1919	Total
1. Falls of Rock (coal, rock, etc.)	62	9	7	13	8	9	10	118
2. Falls of Face or Pillar Coal	33	1					5	39
3. Mine Cars and Locomotives	25	6		5	5	4	3	48
4. Gas Explosions and Burning Gases	5				1		1	7
5. Coal Dust Explosions (Inc. gas and dust)	200							200
6. Explosives	5			1	1	1	1	9
7. Suffocation from Mine Gases	1							1
8. Electricity	1	1	1		1			4
9. Animals							1	1
10. Mining Machines		1					3	4
11. Mine Fires (burned, suffocated, etc.)			1					1
12. Other Causes	5			1	1	1		8
KILLED IN SHAFT:								
13. Falling Down Shafts or Slopes	2							2
14. Objects Falling Down Shafts or Slope								
15. Cage, Skip or Bucket	1							1
16. Other Causes								
KILLED ON SURFACE:								
17. Mine Cars or Locomotives	6			2	1			9
18. Electricity	1		1	1	1	1		5
19. Machinery	2	2						4
20. Boiler Explosions (or steam pipes)	1							1
21. Railway Cars and Locomotives	3	1			1	2	1	8
22. Other Causes	2				2	1	2	7
Total	355	22	11	28	22	19	27	479
		1914	1915	1916	1917	1918	1919	
Fatalities per 1000, 2000-hour workers	6.37	3.71	8.03	7.19	4.40			
Tons produced per fatality	141,047	282,610	155,106	187,510	270,359	171,471		
Tons produced per man day	3.60	4.19	5.90	5.41	4.77			
Average days mines operated	210	208	228	219	259			

ACCIDENTS IN COAL MINES OF UTAH DURING THE YEAR 1918

	Killed	Injured - Time lost, 14 days or more	Injured - Time lost, 1-14 days
UNDERGROUND:			
1. Falls of Roof (coal, rock, etc.):			
(a) At working face	7	52	178
(b) In room or chamber		19	26
(c) On road, entry, or gangway	2	8	14
2. Falls of Face or Pillar Coal:			
(a) At working face		26	72
(b) On road, entry or gangway		2	4
3. Mine Cars and Locomotives:			
(a) Switching and Spragging	1	24	50
(b) Coupling cars		18	40
(c) Falling from trip		2	2
(d) Run over by car or motor	1	13	6
(e) Caught between car and rib	2	18	12
(f) Caught between car and roof while riding			6
(g) Runaway car or trip		13	20
(h) Miscellaneous		13	62
4. Gas Explosions and Burning Gas:			
(a) Due to open light			2
(b) Due to electric arc		1	1
(c) Due to shot			2
(f) Miscellaneous		1	1
6. Explosives:			
(h) Unguarded shots		1	1
(i) Returned too soon	1	1	1
(j) Premature shot		1	2
(k) Sparks from match, lamp or candle			1
8. Electricity:			
(d) Contact with machine feed wire			1
(e) Contact with haulage motor			2
9. Animals		12	25
10. Mining Machines (other than Sc)		16	26
12. Other Causes:			
(a) Falls of person		8	40
(b) Machinery (other than 10)		2	6
(c) Rush of coal or gob			1
(d) Falling timber	1	12	17
(f) Hand tools, axes, bars, etc.		15	81
(h) Miscellaneous		11	84
Totals	15	276	767

ACCIDENTS IN COAL MINES OF UTAH DURING THE YEAR 1918—(Continued)

	Killed	Injured—Time lost, 14 days or more	Injured—Time lost, 14 days or more
IN SHAFT:			
Brought Forward.....	15	276	767
13. Falling Down Shafts or Slopes.....			
14. Objects Falling Down Shafts or Slopes.....			7
15. Cage, Skip, or Bucket:			
(a) Runaway.....		10	2
(b) Riding with timber or tools.....		10	1
(c) Struck by.....		2	4
(d) Miscellaneous.....			
16. Other Causes:			
(b) Breaking of Cables.....		2	4
(c) Miscellaneous.....			
ON SURFACE:			
17. Mine Cars and Mine Locomotives.....		14	20
18. Electricity.....	1		4
19. Machinery.....		4	12
20. Boiler Explosions or Bursting Steam Pipes.....		1	3
21. Railway Cars and Locomotives.....	2		
22. Other Causes:			
(a) Explosives.....	1		
(b) Fall of person.....		6	8
(c) Falling objects (derrick, boom, etc.).....		2	8
(d) Falls or slides of rock or coal.....			10
(e) Hand tools.....			26
(f) Miscellaneous.....		14	31
Grand total.....	19	325	907

SMELTERS ORE DRESSING PLANTS AND AUXILIARY WORKS

A comparison of the accidents which have occurred in the smelters, ore dressing plants and auxiliary works of Utah during the year 1917 and 1919, inclusive, is a source of satisfaction.

Labor and Accident Data for Smelters, Ore Dressing Plants and Auxiliary Works.

	1916	1917	1918	1919
Total day's labor	2,262,523	3,069,688	2,531,162	1,409,954
Fatal accidents	13	18	6	5
Total accidents	1,564	1,583	1,077	550
Fatal accidents per 100,000 shifts .....	.57	.58	.23	.35
Total accidents per 100,000 shifts	69.	51.	42.	39.

The accident experience of these industries show a gradual betterment year by year with 1919 presenting an improvement of 44 per cent over 1916. The improvement in the case of fatal accidents is especially marked with at rate of but .35 per 100,000 shifts for 1919 as against .57 and .58 per 100,000 shifts for 1916 and 1917, respectively.

These figures demonstrate what can be accomplished by safety work conducted in an intensive manner. Nearly all these plants employ a safety specialist whose duty it is to make frequent inspections of the plant, recommend safety devices and safe practices, instruct in and keep enthusiasm aroused among employees as to "Safety First."

As further evidence of the benefits derived from work of this nature the result obtained at the Garfield Smelter of the American Smelting and Refining Company, located at Garfield, Utah, is a striking example. A safety engineer is employed whose full time is given to education endeavor in safe practices, and providing means and measures for safeguarding all processes and machinery about the plant. The record of this plant speaks for his efforts.

· Garfield Smelter.

	Fatal Accidents	Permanent Disabilities	Total Accidents	Accidents Per 100,000 Men Employed
1917	7	13	439	261
1918	3	4	162	105
1919	1	1	28	35

With a view of co-ordinating the efforts of the safety specialists of the several smelters in Utah and to give them an opportunity to profit by the experience and practices of their fellow specialists a monthly conference was inaugurated.

These conferences are held consecutively at one of the smelters or with the Industrial Commission. When the smelters are visited the plant is inspected and notes made of dangerous conditions as well as any specially well guarded hazards or novel devices for enhancing safety. Following the inspection a general round table discussion is held during which matters pertaining to safety or health are in order. These conferences have been the means of keeping not only the smelter representatives alive to the best practices in teaching and effecting "Safety First," but also the members of the Inspection Department have benefited along the same lines.

**LABOR AND ACCIDENT DATA
SMELTING PLANTS AND THEIR AUXILIARY
WORKS—UTAH**

Smelters.

	1916	1917	1918	1919
Men employed	2,401	2,658	3,173	1,832
Days of Labor	878,426	952,918	1,158,145	667,450
Average days active....	365	359	365	365
Killed	8	9	4	4
Injured	622	556	383	265

Auxiliary Works.

	1916	1917	1918	1919
Men employed	857	1,811	1,885	709
Days of Labor	310,352	657,387	681,762	258,652
Average days active....	362	363	362	365
Killed	0	4	0	0
Injured	231	531	169	80

In 1919—One wife left a widow, and 5 children fatherless.

ACCIDENTS IN ALL METALLURGICAL PLANTS DURING THE YEARS 1918 AND 1919

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (time lost, 1 to 14 days)	
	1918	1919	1918	1919	1918	1919
ORE-DRESSING AND MILLING						
ACCIDENTS						
Number Killed or Injured by—						
1. Haulage System:						
(a) Cars and Motors			20	14	46	34
(b) Mechanical conveyors	1		5		6	2
2. Railway cars and locomotives		1	2	1	12	5
3. Crushers, rolls or stamp			5	2	10	9
4. Table, jigs, etc.			9	5	8	5
5. Other Machinery	2		9	5	20	11
6. Falls of persons			24	5	49	7
7. Suffocation in ore bins	1					
8. Falling objects (rocks, timbers, etc.)	1		23	2	48	5
9. Cyanide or other poisoning			1		2	1
10. Scalding (steam or water)			1	3	3	1
11. Electricity	1		7	2	7	2
12. Hand tools, axes, bars, etc.			18	6	42	11
13. Nails, splinters, etc.			24	2	35	14
14. Flying pieces of rock from sledging or crushing				8	11	12
15. Other Causes			23	10	63	13
Total number killed or injured at mills	6	1	170	66	362	139

ACCIDENTS IN ALL METALLURGICAL PLANTS DURING THE YEARS 1918 AND 1919

	Killed		Seriously injured (time lost more than 14 days)		Slightly injured (1 to 14 days) (time lost)	
	1918	1919	1918	1919	1918	1919
SMELTER ACCIDENTS:						
Number Killed or Injured by—						
16. Haulage System:						
(a) Cars and Motors	1	1	27	10	34	15
(b) Mechanical Conveyors			3	2	4	7
17. Railway cars and locomotives			8	1	16	3
18. Cranes			6		8	2
19. Other Machinery	1		39	3	12	5
20. Falls of persons		2	19	8	39	15
21. Suffocation in Ore Bins						
22. Flying or Falling Objects (rock, tim- bers, etc.)			19	11	28	14
23. Gas (burns or asphyxiation)			2		6	2
24. Scalding (steam or water)				1	2	2
25. Electricity			4		2	2
26. Hand, tools, axes, bars, etc.			10	10	28	33
27. Nails, splinters, etc.	1		38	1	31	5
28. Burns from Matte, Slag or Molten Metal (pouring or spilling)			37	29	66	22
29. Hot Metal Explosions			11		5	5
30. Other Causes	1	1	29	23	64	31
Total number killed or injured at Smelters	4	4	252	100	350	165

ACCIDENTS IN ALL METALLURGICAL PLANTS DURING THE YEARS 1918 AND 1919

	Killed		Seriously injured (lost at more than 14 days)		Slightly injured (time lost less than 14 days)	
AUXILIARY WORKS' ACCIDENTS: (Yards, Shops, Constructions, Etc.)	1918	1919	1918	1919	1918	1919
Number Killed or Injured by—						
31. Haulage Systems (cars, motors, etc.)			4	2	5	7
32. Railway Cars and Locomotives			4	2	6	4
33. Falls of persons			2	1	11	3
34. Falling objects (rocks, timbers, etc.)				2	9	6
35. Nails, splinters, etc.			1		4	1
36. Hand tools, axes, bars, etc.			2	8	5	14
37. Electricity					4	7
38. Machinery			6	2	12	6
39. Failure of ladder, scaffold, or other support			8		2	
40. Handling hot material						2
41. Other causes			19	8	16	9
Total number killed or injured by shop and yard accidents			48	25	73	55
Grand totals	10	5	470	191	785	389

LABOR AND ACCIDENT DATA ORE DRESSING PLANTS OF UTAH

	1916	1917	1918	1919
Men employed	3,017	4,103	1,942	1,382
Days of Labor	1,073,745	1,459,383	691,255	483,852
Average days active..	356	356	356	357
Killed	5	5	2	1
Injured	711	496	525	205

In 1919, one wife left widow and one child fatherless.

QUARRIES

The following is a list of the quarries in Utah which have been inspected by the Mine Inspection Department, together with the location of the plant and the kind of rock quarried.

List of Quarries.

Company	Location of Quarry	Material Quarried
American Smelting & Refining Co.....	Topliff (Rush Valley)	Lime Rock
J. S. Smelting, Refining & Mining Co.....	Topliff	Lime Rock
Portland Cement Company of Utah.....	Parley's Canyon	Cement Rock
Union Portland Cement Company.....	Devil's Slide	Cement Rock
Strange Maguire	Richfield	Lime Rock
Langton Lime & Cement Company	Salt Lake City	Lime Rock
Santaquin Lime & Quarry Company	Santaquin	Lime Rock
Thomas Boardman	Provo	Lime Rock
Utah Lime & Stone Company.....	Tempe	Lime Rock
Florence Lime Quarry	Santaquin	Lime Rock

Labor Data at Quarries, 1919.

Average number of days operated.....	289
Average number of employees in the quarries.....	165
Employees in crusher plants, etc.	37

ACCIDENTS IN THE QUARRY INDUSTRY DURING 1918

	Seriously injured (time lost more than 14 days)	Slightly injured (time lost, 1 to 14 days)
IN AND ABOUT QUARRY:		
Number Killed or Injured by—		
1. Falls or slides of rock or overburden.....	3	
2. Handling rock at face.....	4	1
3. Timber or hand tools.....		1
5. Haulage:		
(a) Hand and animal.....		1
8. Flying objects:		
(a) From sledging.....	1	
(b) Others.....	1	
Total killed or injured at quarries.....	9	2
OUTSIDE WORKS:		
(To include rock-dressing plants, crushers, cement mills, kilns, etc.)		
18. Hand tools.....	1	2
24. Handling rock by hand.....	1	1
26. Other causes.....		1
Total number killed or injured at outside works.....	2	4
Grand totals.....	11	7

ACCIDENTS IN THE QUARRY INDUSTRY DURING 1919

	Seriously injured (time lost more than 15 days)	
	Permanent partial disability	Slightly injured (time lost, 1 to 14 days)
IN AND ABOUT QUARRY:		
Number Killed or Injured by—		
1. Falls or slides of rock or overburden	1	5
2. Handling rock at face	2	4
3. Timber or hand tools	2	5
4. Explosives:		
(g) Unguarded shots	1	
11. Machinery:		
(a) Hoisting cables and attachments	2	3
(e) Other machinery	2	1
Total killed or injured at quarries	1	9
OUTSIDE WORKS:		
(To include rock-dressing plants, crushers, cement mills, kilns, etc.)		
18. Hand tools		1
21. Falls of persons	3	2
23. Flying objects:		
(a) From sledging	1	
24. Handling rock by hand		1
Total number killed or injured at outside works	1	3
Grand total	2	12



THE TOPLIFF QUARRY
American Smelting and Refining Co.



THE DEVIL'S SLIDE QUARRY
Union Portland Cement Co.

WELFARE WORK AMONG EMPLOYEES

Welfare work designed to bring the Industrial Commission in closer touch with operating officials, miners, mill workers and smelter employees of the State has been undertaken.

Besides the intimate contact made possible by inspections and conferences held on the works of Miners' Number of Utah's Safety Record has been established. This publication was planned to carry to the workers in a brief but interesting form ideas pertaining to health, safety and welfare. In scope it covers matters of human interest connected with mining and metallurgical work, changes in and additions to the General Safety Orders, articles on health and safety, bits of humor and apt cartoons depicting safety first.

The circulation of the Miners' Number of Utah's Safety Record was at first mainly through the officials of the employing companies who were forwarded copies to be distributed among their employees. With a view to ascertaining the extent of the interest on the part of the employees in the publication and also to provide a means of establishing a closer contact with the individual employee, there were enclosed with each copy of the second issue a return letter and envelope by which more copies could be requested and names be sent to the Industrial Commission to be placed on the mailing list for the future issues.

The 2,692 additional copies requested and the 1,176 names sent in to be added to the mailing list was a gratifying manifestation of the interest which the Safety Record aroused.

Through co-operation with the U. S. Bureau of Mines training in Mine Rescue and First Aid has been carried on throughout Utah. The U. S. Bureau of Mines Rescue Car No. 11 was assigned to this district in July, 1919, and started training in Utah immediately. Most of the metal and coal camps of the State have availed themselves of the courses of instruction offered.

The following summary gives the camps visited and the number of men trained.

Metal Mines.

Camp—	Mine—	Men First Aid	Trained Mine Rescue
Alta	South Hecla	18	0
Bingham	Utah-Apex	7	0
	Utah Consolidated	8	2
	Utah Copper	16	0
Eureka	Apex Standard	3	0
	Centennial-Eureka	10	1
	Chief Consolidated	35	7
	Colorado Consolidated	1	0
	Eagle & Blue Bell	18	7
	Eureka Lily	1	0
	Gemini	3	0
	Godiva	2	0
	Tintic Standard	16	6
	Tintic Zenith	1	0
	Walter Fitch, Jr., Co.	2	0
Gold Hill	Western Utah Copper	12	0
Ophir	Ophir Hill Consolidated	49	9
Park City	Daly West	3	0
	Judge	4	0
	Ontario	3	0
	Silver King Coalition	6	0
	Silver King Consolidated	4	3
	Total	222	35

Coal Mines.

Camp—	Mine—	Men First Aid	Trained Mine Rescue
Castle Gate	Utah Fuel Co.	16	13
Clear Creek	Utah Fuel Co.	14	12
Hiawatha	U. S. Fuel Co.	22	14
Kenilworth	Independent Coal & Coke Co.	20	12
Mohrland	U. S. Fuel Co.	44	16
Scofield	Kinney Coal Co.	6	5
	Scofield	17	10
Sego	American Fuel Co.	11	8
Spring Canyon	Carbon Fuel Co.	14	7
	Spring Canyon Coal Co.	16	8
	Standard Coal Co.	12	7
Sunnyside	Utah Fuel Co.	35	28
Winter Quarters	Utah Fuel Co.	39	11
Total		266	151

Miscellaneous.

Camp—	Mine—	Men First Aid	Trained Mine Rescue
Watson	Gilson-Asphaltum Co.	33	0
Arthur	Utah Copper Co. Mill.....	79	0
U. of U.	School of Mines.....	8	0
Total		120	0

These certificate men trained in First-Aid and Mine Rescue added to those previously trained gives Utah a large number of men trained in resources useful in case of disaster or accidents. For so considerable number of men to take the prescribed courses of the Bureau of Mines is evidence of the interest those engaged in mining are taking in their own safety and the safety of their fellow employees.

Plans for the future welfare work contemplate a more comprehensive program. Arrangements are being completed to carry intensive safety and welfare campaigns directly to men. In co-operation with the U. S. Bureau of Mines the Industrial Commission will conduct a two weeks' campaign in each of the large coal and metal mining camps of the State. The first week will be given over to a general safety and health rally during which motion pictures, lantern slides and talks will be given daily. Every possible co-operation will be enlisted, newspapers, schools, churches, women's clubs, miner's organization and fraternal associations will be asked to stir up interest and lend their every support to make the campaign a success. The second week will be given over to training in First Aid and Mine Rescue. It is hoped by these campaigns to get every man, woman and child sufficiently interested in health and safety that they not only realize that health and safety are desirable but that they are sufficiently desirable to strive after and work for 365 days in the year.

The following pages contain a treatise by G. N. Child of the Educational Development of Utah.

A treatise by President E. G. Peterson of the Agricultural College on the opportunities and development of the State of Utah.

A story of the irrigation development, and possibilities of the State.

A series of short stories giving an insight into the conditions, development, and possibilities of the several counties of the State.

Followed by a table showing bonded indebtedness of Counties, School Districts, and Incorporated Cities and Towns in Utah as of January 1st, 1920.

UTAH'S EDUCATIONAL GROWTH

The people of Utah are proud of their schools. They generally support them well both financially and morally as evidenced by excellent buildings and a very high percentage of school attendance. The growth of the school system has been very steady and comparatively rapid. Indeed, since 1890 up to the present time the schools of Utah have made more rapid advancement in certain carefully selected determining qualities than any other state in the Union. The Russel-Sage Foundation, after conducting an exhaustive survey, gives us the following reports concerning Utah's educational standing as compared with other states of the Union. The survey covers the period of twenty-eight years, from 1890 to 1918, and shows the place Utah occupied in 1890 and again in 1918.

	1890	1918	
1 Per cent of children of school age attending	44	9	Gain 35
2 Days attended by each child of school age	30	10	" 20
3 Days school were kept open	20	19	" 1
4 Proportion of children in high school	46	27	" 19
5 Per cent of boys to girls in high school	12	3	" 9
6 Expenditure per child attending	25	17	" 8
7 Expenditure per child of school age	32	14	" 18
8 Expenditure per teacher employed	10	7	" 3
9 Expenditures for non-salary purposes	10	15	Loss 5
10 Average salary per teacher employed	17	9	Gain 8
Average	27	7	Gain 20

It will be noted from the above report that on an average Utah gained 20 points in twenty-eight years, and that in all the selected bases of the survey the State made material gains, except in expenditures for non-salary purposes. No other state has been able to make a like showing.

During the past two years, with the lessons of the war burned into our consciousness, a very marked growth has taken place in Utah's educational activities. In consequence, certain definite educational objectives were agreed upon in 1919 and set up for realization. Chief among these objectives were good health, good citizenship, vocational efficiency, proper use of leisure, and good habits of study and work.

It soon became apparent that a first step necessary in carrying out this new educational program was a set of laws setting standards and providing necessary administrative powers. Accordingly, a committee on legislation, representing various educational interests was chosen. This committee, after several weeks' of study and careful deliberation, evolved and recommended to the Legislature of 1919 what has since become known as Utah's Advanced Educational Code. This code includes a number of important laws, among which are the following:

Health Education.

Under Health Education an act was passed, creating the office of State Director of Health Education; also providing that Health Education, consisting of sanitation and personal and school hygiene, should be a requirement of all teachers of the public schools in the State. This same law delegates to the State Board of Education the right to determine the professional requirements of supervisors and school nurses. It makes it possible, also, for local boards of education to pay out money for health education among children of pre-school age.

The law has been in operation since May 12, 1919. Considering the short time it has been in operation, a great deal of excellent work has been accomplished. Teachers of the State, quite generally, have read several books dealing with the physical welfare of boys and girls, as prescribed by the State Board of Education. Most districts have provided expert health directors, or school nurses. Medical inspection has become the rule and the teaching of hygiene has taken on more and more the phase of habit formation. In connection with this work, the home and school have worked harmoniously together, the parent-teacher organizations having been most important factors in the work accomplished.

As a part of the health legislation, \$10,000.00 was set aside by the Legislature to aid establishing free dispensaries and clinics. Under the stimulus of this provision of law, most excellent service has been rendered at the Civic Center,

Salt Lake City, under the direction and through the efforts of voluntary organization.

Part-Time Schools.

To provide education for young people between 14 and 18 years of age, who are obliged to discontinue regular school to go to work, a part-time school law was passed. This law compels young people to attend a regular public or private school until they are 18 years of age, unless excused from attendance by school authorities, or unless exempt from attendance by provision of law. It further provides that whenever such young people are excused, by school authorities, from attendance at regular schools, such persons must attend a part-time or continuation school at least 144 hours per year.

The effect of the part-time law has been to increase attendance in the regular day schools, especially high schools; the increase, in a number of cases, running as high as 50 per cent. In many of the smaller districts, therefore, part-time schools have become unnecessary. In a few of the larger cities attempts are being made to establish them.

Salt Lake City, no doubt, has the largest part-time school in the State, under the direction of L. M. Gillilan. It was in operation during the whole of the year 1919-1920, and is again in successful operation this year. At this school, several hundred young people, who are engaged in the various offices, stores and factories of the City, attend for class instruction in chosen subjects.

From short experience with the part-time school we are convinced that it is an institution which fills a real need and is therefore destined to grow, both in size and function. It is to be regretted, however, that very little financial support was provided by the Legislature which passed the law. Adequate financial support is, therefore, an urgent problem at the present time.

Americanization Schools.

The war taught us the importance of Americanizing foreigners. The first step in this process is recognized to be teaching foreigners to speak and read the English language. To meet this demand an act was passed making provision for Americanization classes and compelling attendance thereon of all foreigners between 16 and 45 years of age, until they possess the ability to speak, read and write the English language as well as pupils completing the 5th

grade of the public schools. An appropriation of \$20,000.00 was made to cover the biennium beginning September 1, 1919.

Under the provisions of this law a Director of Americanization was appointed by the State Board of Education, which had been made the administrative head, and hundreds of foreigners have been organized into classes and taught the essentials of the English language. Most of these classes have former a part of the evening school. In Salt Lake City, approximately 400 foreigners are now in attendance. There is no doubt but that these Americanization classes serve a most excellent purpose. It is important, however, that they, too, be properly financed and since the Americanization of foreigners is consistently a national and state problem, rather than a local responsibility, it is but fair that the large burden of financial support rest upon the Nation and the State.

Better Citizenship.

Since the public schools have become important institutions on which the State depends for training its young people to become law-abiding, intelligent, moral citizens, it is not surprising that added authority and consequent responsibility should, from time to time, be given to school officers.

The part-time law, heretofore referred to, makes the school, in a general way, supervisors of all young people up to 18 years of age, whether outside or inside of school. The purposes to be attained are the physical welfare, the intellectual growth, and moral development of the young people. Activities in society and during work hours are therefore important as affecting educational results. What young people do, what they think, and how they live, are matters of concern to those who control or direct education.

During the past year, a great deal of attention has been given to organizing associations for the civic improvement of young people and to supervising their environments wherever their labor makes it necessary for them to spend a number of hours each day. Utah's program of education may be said to be an all-year-round program, including in its general scope all the activities of all the young people during the prescribed school age.

The results of this ambitious program are yet to be determined, as the laws which lie back of it are so recent. It is reported, however, that much less juvenile delinquency is prevalent throughout our State at the present time, than

during the period preceding the attempted systematic moral betterment of all young people. The Juvenile Court records show a decided reduction in the number of cases brought to its attention.

G. N. CHILD.

HOME OPPORTUNITIES IN UTAH

By President Elmer G. Peterson, of the Utah

Agricultural College.

In the selection of a home various factors must be considered. Undoubtedly the most important of these, granting reasonable climatic and economic conditions, is the social and educational factor. The people among whom one lives and rears a family must be people with whom association is desirable and there must be opportunity for the education of the children in the family.

Utah is blessed beyond measure in that its valley communities represent a high average standard of citizenship, with hardly an appreciable division into classes.

The population of Utah is predominately agricultural, the character of the agriculture being of a fairly intensive kind which presumes high intelligence on the part of the farmer. The general educational standard in the state is probably as high as anywhere in the United States and much higher than it is in most sections. The Utah school system distinguishes the State doubtless to a greater degree than any other feature. A strong elementary and high school system exists throughout the State, together with a well developed university and collegiate system. These factors of a social and educational character make Utah unusually desirable as a place for the building of homes and the rearing of families.

The tillable soil of Utah is, on the whole, unusually fertile. The production of certain of the standard crops bring the highest production in the world and the production along all lines which the climate permits is excellent both in quality and quantity. The land is largely held by the people who till it, instead of being concentrated into large estates. This is itself a factor of great and far-reaching importance. It insures a permanency in our civilization which is not possible under different conditions. Valuable range which gives pasturage for hundreds of thousands of heads of live stock is generally to be found close to the arable lands. The type of farming practiced in the State is varied, ranging from vast dry farms in the regions of lightest rainfall, to dairy and beet farms where efficient irrigation systems combine with rich acres to produce big crops. The sugar beet business is one of the most important in Utah and provides a substantial income to

the farmer, which makes farm development much more satisfactory than it could otherwise be. The condensed milk business is in an unusually thriving condition in the northern part of the State.

A one hundred per cent increase in the population, production and prosperity of Utah is not beyond the possibility within the next two or three decades. Such a prediction is based mainly upon the immediate accessibility, under Government patronage, of vast supplies of irrigation water not yet impounded, the expensive area of good land not yet under the plow, the unexploited, but extensive, underground waters available by pumping from practicable depths, and the doubling of the duty of our present supply of water, which is entirely practicable throughout the State. This increase in duty is dependent as much upon more scientific distributing systems, involving unifying channels in many cases, as upon the application of the water to the crops.

In Utah and Idaho the present estimated irrigated area is 3,250,000 acres and in these two states alone there is estimated to be 5,750,000 acres which can yet be added to the irrigated area. This means practically a doubling of the intensively cropped area, with a resultant increase in wealth which will transform these states. Dry-farming likewise admits of very great increase throughout the State if properly and scientifically developed. In dry-farming, extraordinary care is necessary to prevent the attempt to cultivate areas of too limited rainfall or of imperfect soil storage possibilities. Properly selected areas yield very satisfactory returns and admit of good earnings if the business is wisely organized and administered.

In the older sections of Utah the canals are continually being moved higher up, resulting in the fuller utilization of large areas. Drainage of water-logged lands is assuming immense proportions. For instance, there is at present under way the redemption of 125,000 acres of land by tile drainage. Sevier and Millard counties have each organized their fourth drainage district. The drainable land of the West is usually the choicest land, very fertile and well located with respect to market.

The range of the State is continually decreasing; its carrying capacity, however, need not decrease proportionately. The methods of reseeding of grasses, rotation system of grazing, and bedding out herding with sheep, practiced by the Forest Service, insure maximum use of all available plant food.

A greater yield per acre is the problem confronting

the grain growers. A yield of 16.6 bushels per acre for winter wheat throughout parts of Utah, which is mainly dry-farm grain, and 24.7 bushels per acre for spring wheat, most of which is irrigated, is the report obtained from threshing machine records collected under authority of the U. S. Food Administration in 1918. In more than half the counties of the State, work is being done to standardize the wheat crop. Variety tests are used to select varieties best adapted to the locality, while pure seed of varieties adopted is obtained by field selection and from seed plots. Swedish Select oats have proved their superiority over other oats grown in this area through variety tests and are now almost universally accepted as the standard variety. Corn for silage is fast becoming an important crop. The supply of seed adaptable to our many localities are solving the problem by local seed selection.

The growing of sugar beets has raised the plans of farming in every section where they have been introduced. Farmers recognize beets as an important and staple crop. A new incentive to beet culture has recently been added through the use of beet top silage. The pit silos used are inexpensive; the big item is the labor required to put the tops in the silo at the same time the beet crop is being harvested. Results from feeding this silage to cattle and sheep in combination with protein feeds indicate that a far greater value is obtained out of the tops by this method of preserving than is obtained by pasturing off as has been commonly practiced. Among other crops, potatoes are receiving considerable attention in the matter of seed selection. The returns from canning crops are making them profitable in favorable localities. In the fruit sections young orchards are being set out. Demands for trees exceed the supplies of the nurseries.

Crop pests are being brought under control by cultural methods and the use of poison. The saving of crops and range grass through the proper use of strychnine in killing rodents will amount to many thousands of dollars. Grasshoppers have been killed with arsenic. Confidence in this control method has been established and the people no longer fear total loss of crops from grasshoppers.

The range cattle of Utah have been improved by the greater use of pure-bred bulls. In many sections the forestry officials and range users, through their grazing associations, co-operate in upholding this practice. There remains yet, however, considerable need for improving the quality of Western range cattle. Fattening cattle for market is becoming an established industry in several sections and

could profitably be extended to other localities. Feeding first centers around sugar factories because of more economical gains connected with feeding beet pulp and syrup. Range sheep will no doubt decrease in Utah, but this loss may be made up in part by sheep on the farm. During 1918 farm flocks were increased in Utah by 13,000 head. Lamb feeding for the fat market is furnishing a good local market for many feeder lambs and is netting profit to the careful feeder. Dairying in established dairy sections is improving in grade of stock and in dairy equipment. Outside of these sections dairying is giving way to other branches of live stock which are more profitable. Better stock and simple but sanitary equipment should make dairying profitable in the State, which imports many million dollars worth of dairy products annually.

A new feature connected with the hog industry in Utah is that of co-operative marketing, which has been fostered by the farm bureau organizations. Shipping days are appointed, fat hogs are brought in from ten or twenty farms to make a carload, which is sent to market. The proceeds minus actual expenses are turned over to the owners of the hogs. A gain is always realized over the prices of the local buyers. Often this difference is several cents per pound. Under this method of marketing, the hog raiser knows he gets all there is in the hogs and is encouraged to continue in the business.

Farm poultry is generally neglected in Utah, but there is no question that a little investment in equipment and labor would return big dividends. The time is coming soon when the mountain states will not only supply their own requirements, which amount to several millions of dollars per year, but will become an important national center for the distribution of poultry and poultry products. Ideal conditions of climate, native feeds, and freedom from disease, insure a great increase in the poultry industry in the near future.

A review of the agricultural situation in Utah as revealed by the 1920 census shows that the state is resting upon a sound foundation.

The number of farms in Utah, according to the recent census, is 25,662. These farms contain 5,050,410 acres, of which 1,715,380 acres are improved land. Since 1910, the number of farms has increased 18.4 per cent; the total acreage, 48.6 per cent, and the improved acreage, 25.4 per cent. Nine and six-tenths per cent of the land area of the state is in farms, and 34.0 per cent of the farm land is improved.

The value of all farm property is \$311,275,728, as compared with \$150,795,301 in 1910.

The total number of cattle in Utah is 505,578, including 397,563 beef cattle, and 108,015 dairy cattle. Beef cows alone number 175,128, and dairy cows 66,724. The value reported for all cattle is \$22,627,870; for beef cattle, \$16,805,429, and for dairy cattle, \$5,821,441. The number of cattle in 1910 (excluding spring calves) was 379,292.

The total production of milk in 1919 was 29,339,512 gallons, as compared with 26,306,070 gallons in 1909. The production of wool in 1919 was 11,690,303 pounds; of honey, 1,232,239 pounds; of eggs, 5,709,076 dozen, and the number of chickens raised, 1,107,446.

The value of all dairy products, including home use of milk and cream, was \$4,409,087; of eggs, \$2,112,359; of chickens raised in 1919, \$775,212.

The value of all crops for Utah in 1919 was \$57,980,827. The total value of cereals was \$12,388,557; of clover and alfalfa seed, \$1,247,961; of hay and forage, \$24,583,157; of potatoes, \$3,494,607; of other vegetables, \$2,121,281; of beets harvested for sugar, \$10,048,611, and of fruits and nuts, \$3,822,739. As compared with 1909, the total value of crops shows an increase of 218.0 per cent; clover and alfalfa seed, 299.1 per cent; hay and forage, 230.8 per cent; beets raised for sugar, 441.0 per cent, and fruits and nuts, 330.3 per cent.

In 1919, 549,967 acres were in hay and forage, including 365,190 acres in alfalfa, 74,744 acres in tame grasses and clover, 80,942 acres in wild grasses, 15,589 acres in small grains cut for hay, 6,638 acres in corn cut for forage, and 3,890 acres in silage crops. The total production of hay and forage in 1919 was 1,031,609 tons, of which 748,949 tons were alfalfa, and 31,390 tons silage. In 1919 the total acreage in hay and forage (not including corn cut for forage) was 405,428 acres, and the total production, 1,016,075 tons.

TEAM WORK IN IRRIGATION DEVELOPMENT

This paper is a digest of some of the features of two papers on irrigation development written by A. F. Parker, chief engineer of the Utah Water Storage Association. The organization itself is perhaps unique. It is an association of eight counties of Utah, all of which are interested in common sources of water supply. They have joined hands with the aim of getting data sufficiently accurate and reliable, if possible for the formulation of a plan for the most extensive ultimate development possible of the common supply. Mr. Parker, under their direction, has had engineering parties in the field for two seasons working on the problem. His final report to the association has not yet been made. The two papers, which form the basis of the present article, therefore, could only state in a general way some of the important features of the problem, and point out the necessity of co-operation, or as he has phrased it, of "team work" in its solution.

The eight counties in the Utah Water Storage Association are Summit, Morgan, Weber and Davis, which in the main draw their water supply from the Weber River system; Wasatch, Utah, and Salt Lake, watered by the Provo River, and its extensions, Utah Lake and the Jordan River; and Tooele County, which at present has no large water source, but which can, it is believed, obtain a valuable supply through the Provo and Weber systems. The two papers by Mr. Parker deal primarily with the irrigation problems of these eight counties, or such parts of them as derive, or can derive, their water supply from the two rivers. Situations similar to that in the eight counties of the association face practically every county in Utah. The pioneer period, the period of individual or local community effort, has about passed. What remains to do, if ultimate maximum development is to be obtained, is a different as well as a difficult problem.

According to best available estimates, the crop value of the eight counties for 1919, a year of marked water shortage, and therefore of a crop value below normal, was well over \$20,000,000. Ultimate development of the water supply from the two river systems will much more than double this.

The irrigated acreage alone, it is indicated by data available, can be more than doubled. The production can be much more than doubled, for the reason that the water supply, developed to its limit, will be sufficient for the en-

tire irrigation season on the irrigated areas. A large proportion of lands now classed as irrigated are watered only during the flood water season, which ends, on the average, July 1. Such lands can not be devoted to the cultivation of the later-maturing and more profitable crops.

Therefore, if the crop value in a season of shortage of irrigation water is \$20,000,000, it is certainly an estimate low enough to satisfy the most conservative person who learns the facts, that the agricultural production of the lands watered from the Provo and Weber systems may be increased by \$20,000,000 to \$30,000,000 annually, even after allowance has been made for the fact that 1919 prices were probably above normal.

It must be kept in mind that the estimates are based on the possibility of the full and ultimate development, by storage, by high line canals, and by the production of electric power. Power may be produced from irrigation water in transit, giving cheap hydro-electric energy for pumping water for irrigation. It would be utilized in pumping from reservoirs, such as Marsh Lake for Weber County and some Box Elder County lands; from Utah Lake, and to areas above the high line canals. Pumping is probably feasible in Tooele County for certain areas. The power would also have a large commercial value, for it can be produced throughout the year.

Along the Weber River it is possible to irrigate 190,000 acres, in four counties. This is more than twice the area now irrigated and the area now irrigated is chronically short of late water. The prospective water supply will correct this shortage and insure a full supply for all land all season.

The water supply of the Weber River, on an average, a surplus over demands of 77,000 acre feet. This normally can go to supplement the Provo River area, where it is necessary to irrigate, in round numbers 145,000 acres not now irrigated, of which 40,000 are in Tooele County, and also to supply later water for an additional 100,000 acres, which now have irrigation water only early in the season. In the counties obtaining their supply through the Provo there are at present, according to the best information available, 194,000 acres of irrigated lands, not more than half of which has water supply sufficient for the development of the late crops.

Combining the figures for the Weber and the Provo systems, in round numbers, 540,000 acres are possible of irrigation from the two rivers. The present irrigated acreage in the eight counties runs around 285,000 acres. The

counties contain the major portion of Utah's population and wealth. It is well under the mark to say that 15,000 acres in Utah county are irrigated from the Strawberry project and from southern Utah streams not tributary to the Provo proper. Deduct even that small area from the total of irrigated lands in the eight counties, and it is found that the area possible of irrigation with a full season's water supply is just double the area now under irrigation from the Provo and Weber systems.

It may be safely asserted that in years of average precipitation, by developing the total possible storage of the flood waters of the Provo and Weber systems, there may be had a supply of water sufficient, if put to the proper beneficial use, for these areas. But this full storage can not be realized on the Provo without securing a surplus that on average years exists on the Weber, the 77,000 acre feet before mentioned. It must be kept in mind that this Weber surplus is only available on years of water supply that is at least average. In years of light precipitation there will not be enough water for all the lands needing it on the Weber itself.

There is a possible source of supply on the Bear River, where water may be stored in reservoirs on Yellow Creek and Coyote Creek, and thence brought down Echo Creek to the Weber River. There it may be used to replace water diverted to the Provo higher up the Weber. But the water supply of the Bear River is all used to keep up the storage capacity in Bear Lake. There is a flood flow on Black's Fork, in Wyoming, a tributary to the Green River. This might become available to replace the Bear River water diverted to the Weber.

Physical conditions render such a series of exchanges practical. Matters of interstate and other right and interests would have to be adjusted. But the need is insistent, and this matter should not be forgotten. Rather should there be persistent efforts looking to securing this much needed water supply. The interests of the densely populated and highly developed areas watered from the Weber and Provo demand it.

So far as is now possible to estimate costs, it is indicated that about \$5,000,000 will be required for a full ultimate development of the water supply of the Weber River system. On the same basis of cost, which is, of course, only tentative, the full development of the Provo area will cost about twice as much as the Weber River development.

The total is about half of the resulting increase in one year's production, as noted above. Double the estimated

costs, and the cost per acre is still below prevailing prices in Utah for irrigation water rights. It is much farther below what some of the other states are investing to get irrigation water on their lands.

In Utah the white race began irrigation. Yet during the past 15 or 20 years, it is authoritatively stated, the irrigated area of Utah has not materially increased. Development of new areas has largely been offset by the water-logging of lands already irrigated.

The figures given above show some of the possibilities, and also the magnitude of the problem. The magnitude requires methods of development other than have been practiced in Utah in the past.

The outstanding reason that the development of Utah's water supply has not been pushed further is a failure to apply co-operation on an extensive scale, under effective organization and with the aid of the State under proper laws. It is probable that the farmers do not fully realize conditions; that business and professional men are busy with other matters. All the development possible for individual or local community initiative and effort to accomplish in a way of developing water has long since been done. That remaining to do, and so vitally necessary withal, is of such magnitude that general co-operation is needed under organization, directed by men of vision, enterprise, initiative and sound judgment.

Our water supply belongs to the people as a whole. Its development and beneficial use is a matter of tremendous moment. The job requires teamwork. Is it worth while to double the irrigated areas under these two river systems? Is it desirable to provide an additional late water supply to lands now irrigated up to the first of July only, and thus to permit them to mature later and more profitable crops, and to undergo more intensive cultivation generally?

If so, all are concerned in seeing to it that some definite means of co-operation—of team—under proper organization is instituted and that constructive legislation and action is had, to the end that our undeveloped natural resources of water supply may be put to proper beneficial use.

The Utah Water Storage Association is entitled to the thanks of the people for rendering its possible, through surveys and investigations, to make the foregoing statements as to acreages and as to water supply available. They may be relied on as conservative and to the extent necessary to reach definite conclusions as to what may be accomplished.

BEAVER COUNTY

Beaver County is the cradle of the metal mining industry in Utah. Along in the '50s when Brigham Young learned of the approach of Johnston's army, he sent Isaac Grundy down to Beaver County to open up some lead deposits, which the Indians reported had been worked by Spaniards, so that the Mormon pioneers might have plenty of "bullet metal" for emergency purposes. Grundy went to a point about four miles north of the site of the present town of Minersville, on the eastern slope of Mineral Range, and opened up what was purported to have been one of the old Spanish mines. The ore he smelted in a small furnace and the bullion was sent to Salt Lake. The property later became known as the Rollins Mine of the Lincoln Mining district and the industry born there has contributed approximately \$50,000,000 to the wealth of the county.

The prosperous days of Beaver County began in 1872, when Shauntie, Shenandoah City, Elephant City and South Camp were thriving. In 1875 the Great Horn Silver deposit at Frisco was discovered and for ten years or more the Horn Silver was one of the most productive mines in the State. Up to this time it has produced approximately \$21,000,000 and has paid dividends aggregating about \$7,000,000.

The San Francisco, Preuss, North Star, Beaver Lake and Rocky districts lie adjacent to each other in the north central part of the county, about 180 miles a little west of south from Salt Lake City. Milford, a few miles east of the district and on the Los Angeles & Salt Lake Railroad, is the railroad center of the region. A branch line extends from Milford to Frisco and Newhouse and serves the Horn Silver, Cactus and other mines.

To the west of the San Francisco region in the Wah Wah range are the Pine Grove, Wah Wah Pass and English Springs districts. In the western part of the county, about 35 miles north of Modena, is the Indian Peak district. The Mineral Range, in which are the Lincoln, Bradshaw, Granite, North Granite, McGarry, Antelope and Jarloose districts, is about 10 to 15 miles east of Milford and between the Milford and Beaver valleys. Silver and lead are the principal metals, but gold, copper and zinc also contribute liberally to the yield. The Rob Roy and Sheep Rock mines in the Newton district have produced some exceptionally rich gold ore and some unusual gold discoveries at Fortuna have created considerable excitement, but

the mother lode has not been found in either camp. Both the Newton and Fortuna districts are situated in the foothills of the Tushar range, east of Beaver City.

Even before Isaac Grundy started the mining industry on its way the Mormon pioneers had discovered a rich sulphur deposit in the low mountains in the northeastern corner of the county. Subsequent investigations indicate that the deposit is one of the really great deposits of high grade sulphur yet discovered. In a primitive way the deposit was worked by the pioneers. About forty years ago an eastern syndicate established a considerable plant for those days and produced an unusually high grade sulphur, but eventually the distance from rail transportation proved too great a handicap in marketing the product and the property was sold to the Mormon Church. A disastrous fire about ten years ago resulted in the suspension of activities. During the war the old sulphur mine and several thousand acres adjoining were acquired by Chicago interests and the Utah Sulphur Corporation organized. Since that time large sums have been expended in reopening the deposit and in the construction of a modern plant. The construction of a branch railroad to serve the camp, now known as Morrissey, has been discussed but as yet no action in this direction has been taken. The sulphur ore runs from 20 to 80 per cent in purity and with ample transportation facilities the Beaver County property should become one of the world's great sulphur producers.

Nature's generosity to Beaver County has not been confined to minerals, however. It has some of the finest grazing lands in the west; fertile valleys and its mountains furnish excellent hunting and fishing. Stock-growing is an important industry and aside from mining is probably the chief source of income. However, agriculture is forging to the front through the reclamation of arid lands. The soil and conditions generally are well adapted to crops common to a mile-high altitude. The county has an area of 1,712,000 acres, of which less than 200,000 acres are in private ownership according to the assessment rolls. Like in most counties in the western part of the state, development in Beaver has followed two separate and distinct lines—one along the railroad and the other in the back country along the trail blazed by the pioneers. Mining activities probably had much to do with fixing the location of the railroad. Along the Los Angeles & Salt Lake railroad are a few small settlements with Milford the most important and the center of the mining region, and the terminus of a branch line which serves the camps

of Newhouse and Frisco. With the exception of mineral development, almost the entire western portion of the county is devoted to stock raising and practically all of the country is an open range.

In the vicinity of Milford, the Delta Land and Water Company is developing an irrigation project which is intended to reclaim about 12,000 acres of land. Some of the land has been under cultivation several seasons and the results have demonstrated that the soil is exceedingly productive when ample water is available. Some recent experiments in this vicinity have been very encouraging for the development of water for irrigation by means of wells. The investigations have not yet reached the stage that will permit conclusive figures as to water flow and costs. That there is room for further agricultural development is reflected in the farm census for 1920, recently reported by the federal government, in which Beaver County is credited with 373 farms, an increase of about 50 since 1910.

Most of the farming activities are concentrated in the eastern part of the county, in the vicinity of the town of Beaver—the county seat. There the majority of the farms are well watered by mountain streams. Conditions generally are favorable to dry farming in this section. The annual precipitation at Beaver is about thirteen and a half inches as against about eight inches in other sections, except at Nada, where it is a little above fourteen inches. In the vicinity of Nada, the tests for underground water have been encouraging.

The town of Beaver is situated on the old pioneer trail to southern California, within a stone's throw of historic old Fort Cameron, long since abandoned as a military post and converted into an institution of learning—Murdock Academy. It is a picturesque and thrifty little city and since the improvement by the state of the north and south highway through that section, Beaver has become one of the most important controls for Utah-California motor traffic. It also is connected by a good road with the railroad at Milford and the completion of the Fort Post road will give the county good highway outlets in all directions. In addition to Murdock Academy, Beaver has good public school facilities and is making further improvements by the construction of a \$200,000 grade and high school building. It also aspires to a fuller enjoyment of the outing possibilities afforded by the Tushar range just east of town. Included in its program in this direction is the construction of a road to Puffer's Lake, an ideal fishing and

outing resort, and the establishment of a free camping ground at old Fort Cameron.

While Beaver has been bitten slightly on various occasions by the "mining bug," generally it has proceeded along the even tenor of its way and devoted its efforts to agriculture and stock raising. That it has enjoyed a prosperous growth is indicated by the condition of its financial institutions, which show an increase in deposits of about 250 per cent in the past five years. Recently the stock-growers have been improving their flocks and herds through the importation of pure bred stock. This movement, along with conditions of an ideal character otherwise, has directed attention to the possibilities for the dairy industry. The establishment of a local creamery has been under consideration for some time and any movement in that direction undoubtedly would receive the hearty co-operation of the farmers. With proper attention and encouragement Beaver County should become one of the great dairying sections of the state.

BOX ELDER COUNTY

Peach Day is a Box Elder County institution. To be more exact, it is peculiar to Brigham City, the county seat and the center of the peach growing district in northern Utah. Along about the first week in September each year, when Box Elder peaches are at their best, Brigham City stages a big celebration in honor of the luscious fruit that has brought the community fame, and invites the world to partake of her hospitality.

No section of the state is converted more conclusively to the "back to the soil" movement than Box Elder county. It goes in for the best in agriculture, horticulture and stock raising, and maintains just enough in the manufacturing line to stimulate the development of its natural resources. Fruits of excellent quality are grown in abundance with peaches as the feature crop. The returns from agriculture are abundant, the sugar beet challenging the peach for recognition as the county's leading product. And in the live stock field there are many big flocks and herds on the open range and the farms which contribute substantially to the annual income, but for many years past the farmers and stockgrowers have been devoting more and more attention to pure bred animals until now Box Elder County is one of the leaders in the state in this respect. In the ranch of former State Senator Willard Hansen, near Fielding, Box Elder has one of the model farms of the state and the west. There are few poultry exhibitions in the intermountain region where Box Elder is not represented among the prize winners.

In its mountains, too, Box Elder has its scenic canyons and pleasure resorts, as well as valuable minerals. Among the minerals are gold, silver, lead, zinc and some copper and molybdenum, and in the vicinity of Brigham City are extensive deposits of graphite. But on the whole Box Elder residents prefer products of the soil to products of the mines, and mining development has not been extensive.

Its schools are among the best. For proof, see the medal awarded Box Elder schools at the Panama-Pacific International Exposition for marked proficiency.

Box Elder County embraces an area of 5,079.1 square miles—3,250,624 acres—or a little more than the state of Connecticut. Of this, more than one-third is unreserved and unappropriated public land, and subject to acquisition under the various federal land laws.

The county is unusually well situated in relation to

transportation facilities. It is traversed by the new main line of the Southern Pacific across Great Salt Lake, by the old main line of the Southern Pacific around the north end of the lake, by the main line of the Oregon Short Line and its branch from Brigham City to Malad, Idaho, and the Utah-Idaho Central interurban. In addition it has a hard surfaced highway connecting Brigham City and Ogden and improved roads between all the principal towns.

Most of the more important towns are situated along the railroads, among which are Brigham City, Willard, Tremonton, Garland, Fielding, Bear River, Corinne, Honeyville, Deweyville and Collinston.

Although Box Elder boasts more of its peach crop, it grows in abundance and of very excellent quality practically all fruits common to the north temperate climate.



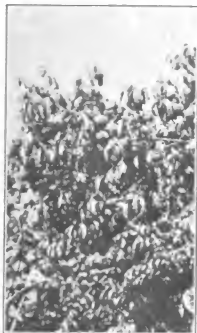
PEACHES

Box Elder County

The Elberta peach is the favorite and represents probably 95 per cent of the crop. Peach orchards vary in price some changing hands as high as \$1,000 an acre, but \$600 an acre probably would be a fair average. The apple crop, too, is a money maker. The Jonathan apple is the favorite, although the fancier brands, such as the Winter Banana, the Spitzenberg and the Delicious are receiving more attention each year. The cherry also is growing in popularity. The average cherry tree will yield about 200 pounds each year and the average price is around 5 cents a pound. The hardy dewberry has practically displaced the blackberry in Box Elder, but the raspberry still is an important commercial fruit. In the vicinity of Brigham City some

interesting experiments are being conducted in the growing of English walnuts.

It would seem as though nature had in mind the beet sugar industry when it started the Bear River meandering through the county. From the time the Utah-Idaho Sugar Company entered the valley about eighteen years ago, vast sums have been expended and much hard work has been put in to properly develop the industry, but the result has been highly satisfactory. Lands with good water rights which formerly were available at \$50 an acre now are in demand at \$200 to \$400 an acre. From a single factory



PEACHES
Box Elder County

at Garland the industry has grown until it now supports factories at Brigham City and Honeyville and has beets to spare to send to the Amalgamated Sugar Company's factory at Ogden. The average yield of sugar beets is around fifteen tons to the acre, although some run as high as twenty-five tons, and the guaranteed price this year is \$12 a ton. The guaranteed price for sugar beets is one of the big attractions the industry has for the farmer. Regardless of the fluctuations of other crops, the farmer knows each year the minimum he will receive per ton for his beets, and under the agreement now in effect he stands

a good show to participate in further profits when the price of sugar advances. There were in excess of 15,000 acres of beets planted in Box Elder in 1920, which, at an average yield of \$150 an acre, would mean a gross income from sugar beets alone of \$2,250,000, and pay days are regular and sure.

There are approximately 30,000 acres planted to alfalfa which yield on an average of about four tons to the acre. Alfalfa is grown almost exclusively in the Bear River valley, which is one of the most fertile regions of the west. Most of the soil is rich, black loam with a sandy clay subsoil. An excess of water in some sections has made drainage necessary. The largest drainage district is in the vicinity of Corinne, where the land has been reclaimed at a cost of \$20 an acre and the value has increased 100 per cent.

Professor J. W. Paxman, formerly dry farm specialist for the Utah Agricultural College, has voiced the opinion that within five years Box Elder County would be producing as much dry land wheat as any two other counties in the state. In the northern part of the county are the Park Valley, the Curlew Valley, the Raft River Valley, the Salt Wells Valley and the Promontory country, all adapted to dry farming, and the big open range is rapidly being dotted by homesteaders' cabins. Nearly a thousand farms have been added to the county in the past twenty years and a very large share of them have been established in the dry farming sections.

During the past year there were in the county approximately 40,000 acres planted to winter wheat and about 10,000 acres to spring wheat. Crop reports indicate that the average yield of winter wheat will be about 18 bushels to the acre, and of spring wheat about 20 bushels. On some of the best irrigated lands, however, a yield of 50 bushels to the acre is not unusual.

Besides sugar beets, alfalfa and wheat, Box Elder grows hundreds of acres of oats, barley, rye, corn, potatoes, timothy and wild hay, and canning crops, such as tomatoes, peas, beans and asparagus. The oat yield frequently is 90 bushels or more to the acre and the average for the past year will be about 70 bushels. The barley crop will average better than 30 bushels to the acre and rye will average about 16 bushels to the acre. Corn has not been grown extensively until within the last year or two, when its value as ensilage began to be appreciated.

Five canning factories in the county have stimulated the production of tomatoes, beans and peas. The tomato

crop, especially, has reached large proportions. The yield is heavy and the quality is excellent. A Box Elder County farmer holds the state record for tomato production, his average being a little more than 36 tons to the acre in 1918.

Box Elder's chief claim to distinction in the mineral line is in the mineral earth in the old lake bed at the north end of Great Salt Lake, a few miles from Brigham City. There the Ogden Portland Cement Company has established a mammoth plant to work the big deposit of marl and clay, the only one of its kind yet discovered. The plant has been in operation almost ten years and the company is one of the big cement producers of the west.

In addition to the cement plant, the sugar factories and the canneries, Box Elder includes in its manufactures a modern creamery at Tremonton. The opportunities in the dairying industry are many and efforts are being made to bring about the establishment of a milk condensory.

Although one of the wealthiest counties per capita in the state, its development is in its infancy.

CACHE COUNTY

It is a source of wonderment to succeeding generations how the trail-blazers of civilization, with uncanny intuition, mark the routes that eventually become the main arteries of travel and commerce and select the sites for flourishing and prosperous communities. While Peter Skeen Ogden, erstwhile factor for the great Hudson Bay Company, gave little thought to future development when he and his voyageurs tramped down from the north about a century ago in search of beaver, nevertheless his selection of a field of operation marked the beginning of civilization in one of the most prosperous counties in Utah and supplied the motif which prompted its name. For, to facilitate trading with the Indians and to insure a central point of trapping operations, it was necessary to select a suitable site for headquarters and a cache for supplies and furs, and because of his selection the valley inherited the name of Cache, which subsequently was bequeathed to the county when it was organized as a political division of the commonwealth.

Cache county, with its 1,205 square miles of territory—771,200 acres—embraces only about half the valley which took its name from the activities of the fur traders. The remainder is in Idaho. Of this area, 181,348 acres of ar-

able land have been improved and 107,033 acres susceptible to improvement are yet to be developed. The Cache National Forest embraces 267,000 acres and the most of the remainder of the land is principally valuable for grazing purposes. From an irrigation standpoint it is one of the best watered sections of the west, and as for agricultural development, with exception of the lands immediately adjacent to the larger cities, it is one of the most intensively cultivated districts of the state. In fact, it might be termed the cradle of agriculture in Utah, for at Logan, the county seat and about the center of the valley, is the Utah Agricultural College, one of the foremost institutions of its kind in America.

While unusually favorable natural conditions and the thrift and industry of its citizenship are primarily responsible for agricultural development in Cache, the close and friendly associations with the College and the constructive criticisms of the members of its faculty have elevated farming in Cache to a plane that is the envy of rural homebuilders throughout the west.

With possibly but few exceptions, Cache County comes nearest to exemplifying the ideas of Brigham Young in the settlement of a new country. Brigham Young was a thorough believer in agriculture and his followers naturally were primarily an agricultural people. It was his idea that the settlers should move in groups and establish and maintain homes at a common center or town, surrounded by their farms, so that they might enjoy the privileges of worship, education and social intercourse which go with community life. Cache County is a vast checkerboard of farms, dotted at frequent intervals by thrifty and thoroughly modern towns, connected by steam and electric railroads and improved highways. Among the more important towns are Logan, one of the most ideally situated and beautiful little cities of the west; Mendon, Hyrum, Wellsville, Richmond, Smithfield, Hyde Park, Lewiston, Providence, Millville and Paradise. Besides steam or electric railroad facilities, or both, the majority of these towns are connected by hard surfaced highways, the principal one of which forms an important link in the Salt Lake-Yellowstone Park route.

Logan deserves more than casual mention for many reasons. It has anticipated the motor travel resulting from its enviable situation by the erection of some of the finest hosteries in the state outside of Salt Lake City. From the Logan River, or more properly from one of its tributaries, Logan obtains a water supply which is not excelled in purity, or quantity to meet the demand, by that of any city

in the Union. Immediately back of the town is the entrance to Logan Canyon, one of nature's beauty spots and an ideal and much frequented summer resort. The climate is delightful, ranging from the warm, growing months of summer, through the brisk, exhilarating spring and fall, to snappy winter weather with characteristic winter sports of the outdoor life. In addition, Logan is the commercial center of the Cache Valley. Its four banks have resources of \$5,676,525. The four knitting factories do an annual business of half a million dollars, and to carry out the quartette idea, the four candy factories are responsible for another half-million dollar business each year. Then there is a beet sugar factory and a milk condensory which are subject to discussion in connection with these industries as a whole, and the vegetable canneries. It has an active Chamber of Commerce whose services are at the disposal of investors, homeseekers and tourists seeking information concerning the city and the county.

While Cache has its model orchards and broad fields of grain, its two big money making industries are beet sugar and dairying. There are three beet sugar factories in the county—Logan, Lewiston and Cornish—which, it is estimated, will pay to the farmer for beets this year \$4,752,000. The output of the factories this year will be worth in the neighborhood of \$11,000,000, part of which will be disbursed for labor, besides the disbursement for beets. In 1919, the milk production averaged 160,000 pounds daily with a total value for the year of \$1,655,776, and 1920 should equal or be better than that of the previous year. The milk condensories, of which there is another quartette, shipped 530,710 cases of milk, with a value of \$2,918,905.

Figures for 1920 on the wheat production of the county show the yield of winter wheat to be 598,537 bushels, and of spring wheat, 327,336 bushels, or a total of 925,873 bushels, valued at \$1,759,196. An excellent market for wheat is afforded by ten milling and elevator companies in the county. The aggregate output of the mills when working to capacity is 1,420 barrels per day.

The adaptability of certain sections to the growing of peas has led to the establishment of canneries. The pea canning industry was started in 1918 on a small scale. In 1919, 25,000 cases of peas were put up and this year the cannery production was 150,000 cases with a value of \$450,000. Fifteen hundred acres were planted to peas this season and the crop yielded the farmers \$157,000. The pea crop is easily grown, is taken off the land early in the

season, and is an excellent crop for rotation, especially with sugar beets.

In some parts of the county the soil is ideal for potatoes and the average yield for the county is approximately 200 bushels to the acre. The estimated value of the potato crop this season is \$285,000. Barley, oats, hay and hardy tree and bush fruits are all successfully grown. The alfalfa hay crop this year is valued at \$1,486,080; other hay, \$236,244; barley, \$63,577; oats, \$289,368.

With the development of the dairy industry, corn has become an important crop because of its value as ensilage. The growing of corn is confined chiefly to the dairy farms and the production is about twenty tons to the acre. The climate of the valley is well adapted to the dairying industry. With five or six months to pasture, the feeding season is not excessively long and extremely hot or cold weather are practically unknown. The value of the dairy herds of the county is estimated at \$456,300; range or beef cattle, \$194,850; sheep, \$731,192; hogs, \$12,772. In addition to the crops grown, an excellent feed for fattening stock is afforded in the beet pulp from the sugar factories.

In giving prominent mention to the Utah Agricultural College it was not intended to lend inference that this was the only educational institution of note in the county. Cache stands high among the counties of the state in relation to its public school system and among other institutions of learning are the Brigham Young College, supported by the Mormon Church, and the New Jersey Academy, a model boarding and day school for girls, which is under the management of the Women's Board of the Home Missions of the Presbyterian Church.

Cache County can accommodate many times its present population. It offers unusual opportunities to the investor and to the homeseeker who is an energetic and progressive farmer. To the tourist, it offers an invigorating climate, inspiring scenery, a pleasing environment and first class accommodations.

CARBON COUNTY

The mention of Carbon County immediately suggests the chief source of Utah's coal supply and one of the chief sources of the coal supply of the intermountain and Pacific Coast regions. Development of the great coal resources of the county has gone ahead at a rapid pace and has done much to divert attention from other natural resources of the county. But the production of fuel has reached such proportions as to make it one of the great industries of the state as well as the county, and for scores of years to come the name Carbon will be associated with the coal industry of the western country.

In discussing the coal resources of the section it is almost impossible to confine statistics to Carbon county, inasmuch as the enormous coal measures fail to take cognizance of county lines and penetrate the surrounding counties of Emery, Grand, Sevier and Uintah. In considering the development of coal resources of the region, however, it is much easier to make a distinction because the greatest activities in this direction have been in Carbon County. Railroad facilities have figured extensively in the growth of the coal industry in Carbon County, and, on the other hand, the accessibility of the coal measures in Carbon County have had considerable influence in the matter of railroad construction. Nearly 90 per cent of the state's annual coal output is produced by the mines of Carbon County, and about 98 per cent of it comes from the district of which Carbon County is a part.

Experts who have made an exhaustive survey of the coal resources of the region on behalf of private concerns have given an estimate which they deem conservative, that there are seven and a half billion tons of coal in the district that can be recovered profitably under present mining methods and conditions. At the current rate of production, which is from four to five million tons a year, there is coal enough in this field to keep the mines operating for the next fifteen hundred years, or enough to supply the wants of the entire United States in bituminous coal for the next fifteen years at the present rate of consumption.

In this region is the only good coking coal yet discovered in Utah. Coking activities originated in the vicinity of Castle Gate, but in recent years it has been learned that certain of the measures around Sunnyside carry coking coal and the coking industry has been moved to that point. At Sunnyside the Utah Fuel Company has built what is

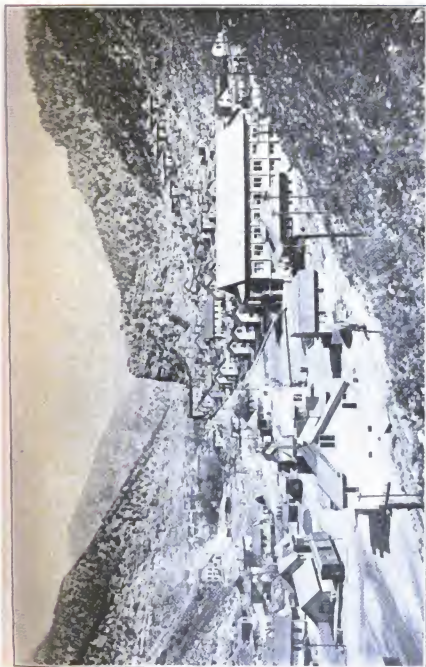
said to be the largest battery of bee-hive coke ovens in the United States. The ovens have a capacity of approximately 400,000 tons of coke annually, but are seldom worked to capacity. The coke is used principally by the smelters of the intermountain country, but a movement is now under way to increase the production and utilize the product in connection with the development of the vast iron resources of the southwestern part of the state.

With the exception of three mines, the bigger properties under active development in the region are situated in Carbon County. A number of strong companies have been operating in the field for many years, among which are the Utah Fuel Company, the United States Fuel Company, the Independent Coal & Coke Company, the Standard Coal Company, the Spring Canyon Coal Company, the Cameron Coal Company, the Liberty Fuel Company, the Peerless Coal Company, the Carbon Fuel Company and the Wattis Coal Company. The production of Carbon County for the past five years follows:

Year	Tons	Value
1915	2,671,055	\$ 4,212,559
1916	3,182,244	5,039,438
1917	3,701,891	7,689,788
1918	4,607,192	12,529,435
* 1919	4,122,338	12,000,000

* Estimated.

The mines are equipped with machinery of the most modern types and are operated under the latest approved methods. The companies have spared neither effort nor expense to make model mining camps and to provide every facility for the safety and comfort of the men. Among the more important coal camps are Castle Gate, Kenilworth, Wellington, Standardville, Hiawatha, Rains, Sunnyside, Winter Quarters, Scofield, Clear Creek and Storrs. Until recently the town of Helper was an important division point on the Denver & Rio Grande railroad and it now serves a useful purpose in the movement of coal from the adjacent fields. Price, the county seat, is the most important town and commercial center in eastern Utah. Not only is it the business center for the coal industry, but it is the railroad



PART OF SUNNYSIDE, UTAH

At Present the Largest Coal Mining Camp in the State of Utah and the Home of the Coking Coal Operations of the Utah Fuel Co. The Large Building in the Right Foreground is the Amusement Hall. Similar Buildings Will Be Found at Many Other Camps.

shipping point for Uintah Basin points. It has a population of about 4,000, three banks with deposits in excess of a million dollars, modern hotels and business institutions, and boasts of being "the biggest little city in Utah."

The coal fields are served by the main and branch lines of the Denver & Rio Grande railroad and by the Utah Coal Route, which is controlled by the United States Fuel Company. Hundreds of thousands of dollars have been expended in recent years in improving the highways of the county and other big expenditures are contemplated in the next few years in connecting the principal towns of Carbon with Uintah Basin and Emery county points.

Despite all that has been done the development of the natural resources of the county still is in its infancy. Many important coal properties are yet to be opened up and the vast deposits of bruinite, ozokerite, elaterite, weggerite and oil shales have not been touched. Promising oil formations have been found but actual development work has not been undertaken. The bruinite deposit, believed to be the largest in the world, is situated near Sunnyside, and the ozokerite, elaterite, weggerite and oil shales are in the northwestern part of the county, adjacent to the Denver & Rio Grande main line.

The following interesting data is supplied by R. L. Stone, executive secretary of the Price Chamber of Commerce:

"The average elevation of the county is 5,500 feet. The maximum summer temperatures range from 95 to 100 degrees Fahrenheit, and the minimum in winter from 13 to 19 below zero. The average growing period between killing frosts is 126 days, and there are 297 full days of sunshine annually on the average.

"In potential wealth Carbon county surpasses any other section of like size in the United States. There are at present eighteen mining camps running full time with an annual output of between four and five million tons of coal. Besides coal, there are asphalt beds, gypsum and a great variety of other mineral bearing strata. More than 5,000 miners are kept busy the year round.

"Carbon County has great possibilities in agriculture. Its large population of miners who are producing the necessities of life, must be fed and 90 per cent of their living comes from outside points. The miners want a good living and are willing to pay well for it. During 1919 patches of onions netted the owners as much as \$1,000 an acre. Cabbage yielded more than sixty tons to the acre. The best farming lands of the country are as yet undeveloped. There



BLACKHAWK MINE TIPPLE OF THE U. S. FUEL COMPANY, HIAWATHA, UTAH
One of the Largest Tipples West of the Mississippi River

are thousands of acres on the higher levels that are adapted to dry farming, and much of this acreage is still a part of the public domain. There is ample room for more food production in the county and there is a ready market for practically everything that can be produced at the mining camps. The total area of the county is 951,000 acres, of which 75,000 acres are farm lands. The recent decision of the Carbon Water, Land & Power Company to rebuild the Mammoth dam, it is estimated, will put 200,000 acres of the best land in the county under cultivation.

"The population of the county is 15,539, an increase since 1910 of 6,915, or 80.2 per cent.

"Price, the county seat, is situated at the mouth of Price Canyon, 121 miles by rail southeast from Salt Lake City. It is the distributing point for the great Uintah Basin, as well as for both Carbon and Emery County points."

Sheep raising is one of the big industries of the county. During the season of 1919 more than 150,000 head of sheep were sheared and 45,000 head were sold and shipped. At the beginning of 1920 there were in excess of 100,000 sheep in the county. Carbon County sheep in 1919 produced seven and one-half pounds of wool per head which was sold at an average of 48 cents a pound. The wool shipments aggregated 1,275,000 pounds. The average sale price for sheep last season was \$6.50 a head. The sheep fed on hay and grain numbered 30,000 and the remainder were fed on the desert winter range of the public domain. Two or three times as many sheep could be fed if the acres of good undeveloped land were put under cultivation.

The cattle and dairy industries must not be overlooked in Carbon County. There are approximately 250 ranches in the county with over 1,000 milk cows, averaging a little better than four per ranch. During 1919 more than 6,000 head of mixed cattle were shipped east, the variety being about equally divided between Durhams and Herefords. There were fully 12,000 head of cattle left after the fall shipments. The average price received was about \$65 a head.

There is a big local market for dairy products. The 5,000 miners in the county consume large quantities of dairy products, much more than is produced locally. There is room for 10,000 head of dairy cattle in the county, as the Salt Lake and Denver markets are easily assessable if there should be an over production for local use.

DAVIS COUNTY

Someone has remarked that articles of the highest quality or value are put up in small packages. Then some wag has been unkind enough to mar this rather pretty sentiment by suggesting that a similar condition obtains in the case of the deadliest poisons. But such a conflict in opinion does not deter Davis County from being a garden spot of Utah and the smallest county in the state insofar as land area is concerned. For, while statistics concerning the state show Davis County to be a trifle larger than Morgan County and charge it with an area of 651.2 square miles, it is on rare occasions only that there will be an explanatory note to the effect that almost two-thirds of Davis County is covered by the briny waters of Great Salt Lake. Aside from Antelope Island, the land area of Davis county is confined to a narrow strip along the east side comprising approximately 275 square miles, the majority of which has been converted into a big truck garden with orchards here and there to break the monotony. Supporting the suggestion in relation to diminutive size and high quality in its application to Davis County, it is only necessary to refer to the assessment rolls which show that although Davis is twenty-ninth, or last, among the counties of the state in size, it is eighth in assessed valuation.

Davis County is just a narrow strip of exceedingly fertile and generally highly cultivated land wedged in between the Wasatch Mountains and the great inland sea, which supplies not only a large share of the foodstuffs but as well the main paths of commerce and communication between the two chief cities of the state—Salt Lake and Ogden. Insofar as transportation needs are concerned, those of no county in the state are so well cared for as are the needs of Davis. Serving this narrow strip are the main lines of two transcontinental railroad systems—the Denver & Rio Grande and the Oregon Short Line—the Bamberger Electric Railroad, one of the links in an inter-urban system which serves approximately 80 per cent of the state's population, and a branch of Salt Lake City's traction system between Salt Lake City and Centerville. In addition to the rail facilities, this same narrow strip of land is traversed from end to end by a hard surfaced highway which connects Salt Lake and Ogden and the northern and southern parts of the state as well. From the county's southern line, which is almost within the northern limits of Salt Lake City, northward to Layton, a distance of about

twenty miles, so thickly is the country settled along this hard surfaced highway that it is difficult to tell where one town stops and another begins. Within this territory are North Salt Lake—the stock yards and packing house district—Bountiful, Centerville, Farmington, Kaysville and Layton. And all are thriving, progressive and thoroughly modern little cities.

Although Davis County serves many useful purposes, primarily it is a truck garden and orchard section and destined some day to become one of the choice suburban residence sections of the state. With ready markets for everything in the way of foodstuffs that can be grown, it is to be expected that the day of cheap lands in Davis County has passed. That is, cheap lands in the ordinary sense of the term. For, while the sale price or market price of the lands may sound high, as a rule the net annual returns from the property would represent anywhere from 10 to 20 per cent on the investment at the market price. Educational and transportation advantages, environment and everything considered, the prices asked for the lands generally are decidedly reasonable.

The country around Bountiful and Centerville is probably the most highly improved section of the county. It is devoted to gardening, fruit growing and floriculture. From Farmington—the county seat—north, in the section including Kaysville, Layton, Clearfield, Syracuse and Clinton, land prices generally are cheaper. The bench lands produce deciduous fruits unexcelled by those of any district in the state. From Kaysville northward, tomatoes and sugar beets are produced in quantity and of high quality. The tomatoes of that section are keenly sought by canners and have won more than a local or sectional reputation for quality. There are seven canning factories and one sugar factory in the county which provide ready markets for all sugar beets and canning crops that can be produced.

Large land holdings are exceptional in Davis County. Most of the holdings are small and if the land is susceptible to cultivation it usually is being farmed on an intensive scale by the owner. There are approximately 1,500 farms in the county and the total area classified as farming lands, which includes pasturage and dry farms, is about 63,000 acres. Of the total farming area, 27,000 acres are irrigated, 17,000 acres are dry farm lands, and 11,000 acres are waterlogged and available for pasturage only when they can be utilized at all. Generally it has been considered that approximately 45,000 acres in the county were susceptible to irrigation but more recent investigations indicate that

the possible irrigable acreage is about 80,000 acres. This large an irrigated acreage, of course, would contemplate construction of high line ditches and the pumping of water to a considerable height, all of which no doubt can be done at a rather heavy cost, and will be done when land values will justify the expense. When it is considered that the average return on garden crops in this section is around \$250 an acre, it is not difficult to conceive an expenditure



EAST CREEK RESERVOIR

**Impounding Water for Irrigating
Weber and Davis County Farms**

of \$200 or more an acre if necessary to obtain the water with which to make the land productive.

Crop estimates for the year 1920 are not yet available, but those of 1919 reflect conditions fairly well in Davis County, although the yield generally throughout the semi-arid country was far below normal because of the unusual drouth. The 1919 figures on staples in Davis County are:

Crop	Acres	Total Production	Average Yield
Winter wheat	5,940	99,000 bu.	16.7 bu.
Spring wheat	3,800	83,800 bu.	21.8 bu.
Oats	620	26,660 bu.	43.0 bu.
Barley	1,300	42,510 bu.	32.7 bu.
Corn	750	22,500 bu.	30.0 bu.
Alfalfa	11,800	34,200 tons	2.9 tons
Potatoes	1,600	265,360 bu.	165.0 bu.

An experimental farm recently has been established by the Utah Agricultural College near Farmington that is expected to be of great benefit to the farmers of the county. The College has obtained twenty acres at an annual rental of \$80 an acre on a five year lease, with option to purchase. Features of the work to be undertaken are crop rotation, soil treatment, seasonable planting and irrigation.

While some of the lands are irrigated from the mountain streams and a few from wells, the most of the water comes from the Weber, Ogden and Jordan Rivers. The Davis & Weber Canal Company supplies water for the greater portion of the land now irrigated, having an aggregate acreage of 49,200 acres, of which a part is in Weber County. There are about 8,000 shareholders in the canal company. The shares now have a market value of about \$150 a share and have a rental value of \$12.50 to \$15 per share a year.

Steps to increase the water supply for irrigation already have been taken and it is expected that some additional acreage will be put under water next year. The Bonneville Irrigation District was organized several months ago and embraces about 5,000 acres of choice land around the city of Bountiful. Practically all of the land in the district has been or is now under cultivation and some of it has a partial water supply. It is estimated that the project will cost about \$600,000 and a bond issue in that amount has been authorized. The lands in the district now have an assessed valuation in excess of \$1,600,000, and the proposed improvement is expected to enhance the value close to a million dollars more.

Another irrigation district is being organized in northern Davis County, but details of its plans have not yet been announced. Another work that would mean a great deal

to the county would be the drainage of the waterlogged lands in the lower part of the valley. In this same section persistent efforts are being made by several companies to produce oil and gas for commercial purposes. A score or more years ago several gas wells were brought in west of Centerville and Farmington, and the gas was piped to Salt Lake City. For some reason the supply of gas was reduced to such an extent that the contract became a subject of litigation and all activities ceased. Operations have been resumed by new companies recently in an effort to get the old wells and new ones back to a producing basis, but nothing of importance has resulted as yet. An adequate supply of gas from this field would be a boon to Salt Lake City and the surrounding country.

DAGGETT COUNTY

The residents of the northeastern corner of the state found it decidedly irksome to travel four to eight hundred miles through two states the major portion of the year when they had business at the seat of county government hardly fifty miles away, so they sought permission to establish a county to fit their particular needs. In 1917 the whole of Uintah county, of which the dissatisfied district was a part, voted on the question and the county of Daggett, the newest in the state, was born. The cause of the division was the fact that the road from the northern portion of the county across the Uintahs to Vernal was never good for more than a very uncomfortable and frequently hazardous trip by wagon, and for probably nine months out of the year it was almost impassable even for horseback traffic. When the road was impassable a journey to Vernal meant an overland trip northward to the railroad in Wyoming, a rail ride to Salt Lake or Price, or sometimes to Mack, Colorado, and a stage ride from the railroad to the Uintah county seat. It may cost a little more to operate a separate county government, but there certainly is a considerable saving in rail and stage fares as well as in time.

Daggett county is small in area and population, but comfortably situated in relation to natural resources, contented with its lot and confident that coal and oil development some day will make it at power in the sisterhood of counties. Roughly, it includes that part of the state east of Summit county to the Colorado line and between the ridgepole of the Uintah mountains and the Wyoming line. On the whole the country is rough, but there are numerous little valleys with fertile soil and well watered by mountain streams. The section is peculiarly adapted to stock raising and to that industry it is chiefly devoted. The mountains and higher lands furnish excellent grazing during the summer months and the lowlands form one of the finest winter ranges in the state. Contrary to what might naturally be expected in that country and that altitude, extremes in temperature are practically unknown in the lower country and the winters are mild.

On the whole conditions are not especially favorable to the growing of vegetables and fruits generally, but the hardier vegetables and fruits are grown to care for local needs. The soil and the climate are adapted to hay and small grain and there is a ready home market for all hay and grain grown. While some dry farming is done, most

of the land cultivated is under irrigation. Much of the reclamation work is the result of individual effort, but in the Lucerne valley the Sheep Creek Irrigation Company has brought under cultivation or canal about 10,000 acres of fertile land. In this vicinity are the town of Manila, the county seat; Linwood and Antelope. Bridgeport, situated on Green river, is the principal settlement in the eastern part of the county.

In discussing the resources of the county its citizens insist upon calling attention first to the unusual opportunities Daggett offers to seekers of health and pleasure. Its climate embraces four distinct seasons, none extreme but each and all exhilarating. In its mountains, snowclad throughout the year, is some of the most inspiring scenery in the Rocky mountain region and hunting and fishing which are seldom equalled in the territory between the Rio Grande and the Canadian line.

But Daggett has other resources that are of interest in a strictly commercial way. Investigations in recent years by the federal government indicate that one of the great phosphate fields of America lies along the foothills on both sides of the Uintahs. No detailed investigation to determine the magnitude of the deposit in the various localities has been made, but the surface showings in Daggett are sufficient to indicate the importance of the field to future development of the county. There have been discoveries of metals in the Uintahs, too, some very high grade copper showings, and occasional pockets of other minerals, but the most of the work still is left for the prospector to do.

Coal is another resource from which Daggett expects much. The principal coal discoveries are situated in the Henry's Fork country where the vein appears to be eight to ten feet thick and the coal of good quality. While there may be some coal taken out to supply the local demand, no mining of any pretensions has been undertaken.

The oil boom in Wyoming in recent years has caused Daggett county people not a few thrills and some serious reflection. The various developments in that part of Wyoming adjacent to Daggett have been of sufficient interest to oil operators and geologists to cause them to make some rather extensive investigations as to the oil possibilities in Daggett County. Of course, oil is where it is found and usually it takes a drill to find it, but several oil operators and geologists and almost every citizen of Daggett are confident that the oil field does not stop at the Wyoming state line. For several months plans have been under dis-

cussion which are intended to provide for drilling operations next spring to prove or disprove the theory that Daggett County is within the oil zone.

Daggett County has good agricultural and grazing lands available at very reasonable prices; it has many opportunities for the man of energy and integrity; it needs more citizens.

EMERY COUNTY

Embracing an area of 4,549 square miles, Emery county has been well named the "Empire of Emery," for it is a veritable empire in itself with the single exception of population. The largest oil land withdrawal in the State and one of the largest in the United States is situated in Emery County and embraces approximately a million acres in the San Rafael region. Vast coal deposits are known to exist but development has only begun. And there are carnotite ores, gypsum and other mineral deposits representing potential wealth of untold millions.

Within the boundaries of the county is embraced two-thirds of Castle Valley, so named because of the many castellated monuments that appear within and define its boundaries, which give to the eye a feast of imagery and fascination, and to the susceptible mind and inspiration of illimitable possibilities.

At the southern end of Castle Valley is the San Rafael swell, one of nature's most peculiar geological curiosities, and from which arises the most fantastic peaks, spires, domes and turrets to be found on the continent, bearing forms of castles, temples and cathedrals, with here and there lofty peaks and precipitous cliffs, and all revelling in a riot of color. When the rays of a rising or sinking sun flit from one point to another upon this heterogeneous mass of earth's mammoth mole, nature is seen in her most playful and spectacular mood, presenting scenes that irresistibly seize the beholder and fill him with awe until the enchanting spectacle dissolves from view.

Paradoxically, this peculiar scrap-pile contains great mineral wealth, for within it lie untold millions of dollars' worth of carnotite ore, and near it fields of oil, evidenced by numerous seepages which produce a few gallons daily. Experts are not inclined to accept oil seepages as indicative of the immediate presence of an oil basin, but results following exploitation upon and near the San Rafael swell, in the Sinbad Valley and in the field about Green River City, justify its continuance by a dozen or more companies. And since the passage of the oil leasing bill by Congress there has been a rush to the district by many of the larger oil corporations of America to stake out locations for filing with the Government in connection with applications for permits to prospect for petroleum.

For several years Green River City has been the shipping point for several car loads of carnotite ore, dug from

Emery and Wayne counties. Another great asset to the county, though as yet undeveloped, are great beds of gypsum, one of the largest of which outcrops on the west flank of the San Rafael swell. The gypsum area is sixty miles long by twenty-five miles wide, and particularly large outcroppings are found near the town of Cleveland on the north, and the town of Emery on the south. C. E. Lupton of the United States Geological Survey estimates the amount of gypsum contained in the Emery County deposits to be 9,701,600,000 tons; 2,429,400,000 tons are in one bed, which has an average thickness of ten feet, and over 7,000,000,000 tons in another bed, having a thickness of thirty feet.

Bordering the county on the west is the Wasatch mountain range, on the Emery county side of which for a distance of nearly seventy miles are some of the greatest measures of the best coal in the State. It is estimated that this field alone contains in the neighborhood of six billion tons of bituminous coal. Carbon County, to the north, having been provided with better transportation facilities, has obtained a start on its southern neighbor in the development of its coal measures, but within recent years, Mohrland, one of the newest and largest coal camps, has been opened up in the latter county. Another new coal camp is Black Hawk, situated on the Emery-Carbon line with the mines in Emery County.

While rich in mineral resources that have been provokingly slow in developing, agricultural development has been somewhat more rapid. The county has a land area of 2,849,920 acres, much of which is mountainous and broken, and consequently not susceptible to cultivation. There are now 759 farms and about 90,000 acres under irrigation. Some fifty independent irrigation enterprises have more than 250 miles of canals and fifteen reservoirs with a capacity of 14,000 acre feet of water. Among other districts in which there are promising possibilities for irrigation development are 5,000 acres at Woodside, 30,000 acres in the Buckhorn Valley and 65,000 acres west and north of the San Rafael River, besides the mammoth project at Green River City which is contemplated to cover about 240,000 acres of land, approximately half of which is in Emery County. The Green River project contemplates the construction of a huge dam about thirty miles north of the town of Green River, and is under consideration by the United States Reclamation Service. There is ample unappropriated water for these and other tracts of first class agricultural systems to conduct the water to the soil.

Wheat, oats, barley and rye are profitable crops, and

alfalfa thrives exceedingly well. Emery county was among the first to engage in the growing of alfalfa seed, a crop which yields exceptional returns for the labor. Alfalfa hay yields an average of three tons or better an acre.

The soils are particularly adapted to the culture of sugar beets. Experts of the State Agricultural College have pronounced these soils equal to the best in the state. Transportation and factories are the only essentials lacking for the establishment in the county of one of the greatest sugar manufacturing industries in the state.

Horticulturally, Emery county is a proved success. In Castle Valley, from Huntington south to Ferron, apples, pears, plums, prunes and cherries are most profitable crops. Around Ferron is a small peach belt equal to any in the state insofar as quality of the fruit is concerned. In Castle Valley prodigious crops of currants and gooseberries and, in some parts, raspberries, near perfection.

The Green River city fruit belt has long been famed for its peaches, pears, apples, grapes and other fruits. In recent years special attention has been given to the growing of cantaloupes and watermelons, particularly winter melons. Nature seems to have placed in the soil of this section the proper constituents to produce perfect cantaloupes and winter melons.

In the production of honey, Emery County is second to none. Its vast fields of alfalfa and red clover bloom and fruit blossoms give both quality and quantity to its bee colony products, and eastern markets for its honey have long been established and several carloads are shipped annually.

The live stock industry is most important to the county. Large flocks of sheep and herds of cattle and horses pasture on the national forests in the summer and on the stretches of the open desert in the winter.

Few counties in the state are provided with better home markets for their products. The local and Carbon County coal camps are near the Emery county fields, orchards, farmyards and stock ranches, and everything produced thereon finds ready sale at consumers' prices.

There are vast tracts of unappropriated lands in the county. Land, too, with primary water rights can be bought at prices ranging from \$20 to \$100 an acre. In fact, it appears safe to say that in Emery County there is more good irrigated land available at lower prices than in any other section of the state.

Opportunity awaits the poultryman and hog raiser in Emery. Everything necessary for the production of mar-

ketable poultry and hogs grow in abundance and the consumer is nearby with ready money to purchase the commodities.

What has been accomplished in the development of the county covers but a short period, for it was only in the early seventies that Orange Seely headed a colony of Sanpete farmers to Castle Valley and established the first white settlement in the county. Now there are a number of towns ranging in population from 300 to 1,000 inhabitants, many having water systems, electric light plants and all splendid, modern school facilities. Castle Dale, the county seat, and Ferron have academies besides, where high school courses are given.

The rivers of the county, particularly the Green River, are sources from which cheap power may be obtained for manufacturing as well as for use in irrigating fields and orchards.

GARFIELD COUNTY

If Garfield County had nothing else to commend it to public attention it has in Bryce Canyon an attraction which, when proper publicity is given, will bring people from all corners of the earth to pay homage to a masterpiece carved by nature in her most fanciful mood. Western America abounds in scenic wonders, but Bryce Canyon is something different. Only within recent years, since the motor car



IN BRYCE CANYON
Garfield County

brought about an improvement in the highways of the southern part of the state, has the existence of this wonder spot become known even to the people of central and northern Utah. Each year sees the list of visitors grow larger and yet the volume of sightseers is very small because the canyon is somewhat off the beaten trail. Many descriptions have been written of it and all are different, but one of the earlier visitors gave expression to his feelings as follows:

"Bryce Canyon—a name so prosaic as to be utterly without a suggestion of the extraordinary or the beautiful—is one of the scenic features of America, in comparison

with which the world-famed Garden of the Gods appears no more than a mediocre piece of nature's handiwork. And it deserves to be, and doubtless some day will be, set aside and protected by the national government as one of the natural and scenic wonders of the western hemisphere.

"There is but one Grand Canyon; there is only one Little Zion. Yet in fantastic carving, in gorgeous coloring, in splendor to the point of barbarity, neither excels the southern Utah chasm of prosaic name—Bryce Canyon—situated in the Pink Cliff district near the rim of the Great Basin, less than ten miles off the main traveled highway between Panguitch and Tropic. * * * *

"Gradually my eyes became accustomed to the dazzling splendor of the chasm; terror gave way to appreciation, and I tiptoed to the brink of the precipice and gazed in wonder and admiration upon fantastic carvings and gorgeous colorings of nature, the like of which I have seen nowhere else.

"Slowly, in the intensity of the mid-day sun, the mass of color dissolved; from it came a chaos of all hues of red—deep, dark, almost somber, to brilliant vermillion, and tapering down to a delicate, pinkish white—and figures jutting upward a hundred feet, five hundred, possibly a thousand, like gigantic stalagmites stained with blood, assumed definite form. And, by way of contrast, deep down on the floor of the canyon, at the bottom of a thousand feet of emptiness, flashed the peaceful, yet vivid green of another forest.

"Massive cathedrals of darker hues pushed heavenward their delicate spires; grotesque gargoyles sculptured by wind, sand and water, glared from cornices. And to complete the illusion, splotches of the more delicately colored sandstone glistened in the sunlight like stained glass windows. Between the massive walls were wonderful rooms and hallways chiseled by time and the elements.

"Tall and graceful pedestals of brilliant hues were topped by broad tables of a delicate pinkish white; on spires, buttresses and monoliths were perched fanciful carvings of birds and animals of prehistoric size, and below, in attitude of watchful waiting, stood the figures of giants and gnomes. Figures innumerable were aligned row above row in semicircular formation in a bowl shaped amphitheater, while on the mammoth stage to the front, others, clothed in brilliant scarlet, were arranged with military precision in long, straight lines, as though on parade.

"In the distance the formations once again became a chaos, giving way to snow-white stretches and hummocks

of sandstone which merged with the ridges rising gradually to form the opposite wall of the canyon. Every turn brought something new and startling and the formations and the colorings changed almost continually with the shifting of the shadows. At no time was the black art of the conjurer necessary to the evolution of something novel and wonderful.

"'Daddy,' came a wee voice which rent the canyon stillness with the startlingness of a pistol shot, 'when do the fairies play?' And that query conveys more eloquently than any words of mine the atmosphere of Bryce Canyon after the first terrorizing view."

And Garfield County has more than Bryce Canyon to offer in the way of scenery, but the county is not all scenery. It has an area of 5,345 square miles—3,420,800 acres—of which more than one-third is occupied by national forest. The eastern part of the county is little explored, but such exploratory work as has been done indicates that the section is exceptionally rich in mineral resources. In the vicinity of Hite on the Colorado River prospects have been conducted in a sporadic manner for many years. The work has been carried on chiefly by individuals and the output has not been large. Northwest of Hite are the Henry mountains where some metal properties have been worked in a small way. While a comprehensive survey of the district has not been made, the information available indicates that the section is heavily mineralized and that if rail transportation were available considerable development would be undertaken.

The greater part of eastern Garfield county has not yet been surveyed. That oil indications were favorable in some parts of the section is evidenced by the fact that a large area has been withdrawn by the federal government as oil land. All this, however, now is subject to development under the provisions of the oil leasing bill passed by congress about a year ago. In the vicinity of Escalante numerous croppings of coal have been reported and in a few places the veins have been opened up in a crude manner to provide fuel for local use. Information of an authoritative character on the resources in this section is extremely scarce inasmuch as such investigations as have been made were for the most part conducted by inexperienced persons.

The county as a whole is especially adapted to stock raising and that is the principal industry. In the western part of the county there are numerous thrifty settlements with nearby farms which are devoted principally to grain and hay. In the extreme western part is the upper valley

of the Sevier River, an extremely fertile and well watered region but a little high and cool for other than hay and grain crops. The whole section should make an ideal dairying district if rail transportation were available. Panguitch, the county seat, is in this region, as are the towns of Hillsdale, Hatch, Tropic, Henrieville, Cannonville, Georgetown, Widtsoe and Escalante.

The country around Widtsoe is one of the most promising dry farming sections of the state. The town is situated pretty well up toward the head of what is known locally as John's Valley, more recently christened Emery Valley. There are probably 40,000 to 50,000 acres of arable land in the valley and there are now about 8,000 acres under cultivation or in fallow. Wheat, oats and barley are the principal crops and the products are of an exceptionally high quality and the yield generally is very satisfactory. Widtsoe is only a few years old and growing rapidly.

The country around Tropic, Cannonville and Henrieville is lower and fruits of excellent quality are raised chiefly for local consumption. All three of these towns are within a few miles of Bryce Canyon and the tourist travel gradually moving in that direction is steadily providing a wider market for foodstuffs produced in that locality.

Panguitch is the principal town and outfitting point in the county. It is fifty-five miles from the railhead at Marysvale. A good highway has been built, however, connecting Panguitch and all the principal towns north through the central part of the state as far as Salt Lake City. The highway improvement has gone south of Panguitch and gradually is being extended further south toward Kanab in Kane County. The construction of this line of highway was undertaken primarily, of course, to give the southern towns a northern outlet but now the work is being pushed with a view to providing a scenic circle tour which would include Salt Lake City, Fish Lake, Bryce Canyon, Grand Canyon, Zion National Park and the Cedar Brakes region—one of the greatest scenic tours in America in anything like the same mileage.

GRAND COUNTY

Its early settlements dating back within ten years of the arrival of the pioneers in Salt Lake Valley, and rich in natural resources, Grand County remains one of the untamed sections of the state. Its surface, its elevation and its climate highly favorable to grazing, the county as a whole has given its attention chiefly to pastoral pursuits and ranks as one of the big stockgrowing districts of the commonwealth. Embracing 3,819 square miles of territory, its population is small and scattered. In itself it is a little empire which some day will be one of the great producing sections of the intermountain region.

The oldest and principal town is Moab, the county seat, situated in the southern part on the Grand River. Other settlements are Dewey, Castleton and Richardson, and the principal shipping point for the county—Thompsons. With the opening of coal deposits in the Book Cliff region in recent years the town of Sego has been established. The main line of the Denver & Rio Grande traverses the county east and west about the center, and a branch line serves the mines at Sego. In the past half dozen years considerable highway improvement has been undertaken to connect Moab and the towns of San Juan county to the south with the railroad at Thompsons.

While stockgrowing is the chief industry, in a county of small and scattered population it naturally would not assume proportions of a great magnitude. According to the assessment last year, the live stock in the county were valued at \$1,737,000, of which the sheep represented in excess of \$1,200,000, and cattle approximately \$500,000.

Although the agricultural possibilities are great, development has been only in keeping with the increase in the number of settlers. Being a stockgrowing section, the principal object of the farmers has been to provide hay and grain for such winter feeding as was necessary. And this has been comparatively little, for the climate is so mild as to make it necessary to feed only a short period each winter. Moab boasts of an average of 325 days of sunshine each year and of its two crops of strawberries annually. The thermometer rarely registers below zero and seldom as low as zero, and the Grand County resident takes particular pleasure in comparing the climate there with that of southern California. And he always makes particular mention of the absence of fogs.

In the central and northern parts of the county there

has been very little agricultural development, although the west central section promises to become one of the great fruit and melon districts of the west when water for irrigation is available. The water is there, in the Green River but to attempt to make use of it would require co-operative effort on a gigantic scale or big capital. A project providing for the storage of waters of the Green River in Emery County above Green River City is under contemplation by the United States Reclamation Service. The construction of the project would bring under water approximately 240,000 acres of land, the area being divided about equally between Grand and Emery Counties. The construction of the project also would provide energy for a 90,000 horsepower hydro-electric plant which would care for the power needs for that section for many years to come.

In the country around Moab fruits of most unusual quality are produced. The valley is surrounded by high bluffs which afford protection from the winds and reflect the sunshine to the soil, and the soil itself is wonderfully fertile and free from minerals. Moab peaches, apples, pears and grapes are prize winners wherever they are exhibited and command top market prices. Apricots, persimmons, cotton, almonds and English walnuts are products of the valley, and watermelons, cantaloupes and winter melons attain great size and are of delicious flavor.

Alfalfa is a staple crop and the yield is heavy. The yield of wheat, barley, oats and other small grains is highly satisfactory. According to estimates of the United States Department of Agriculture, land values in the county are unusually high. Farm lands are valued from \$53 to \$120 an acre, the average price per acre being \$110. Corn thrives in this section, one farmer raising 156 bushels to the acre a few years ago.

Grand County, like its neighbors, has vast coal resources. Five miles north of Thompsons is the mine of the American Fuel Company, a concern controlled by Salt Lake capital. The property was opened up in 1912 and has been operated consistently since. The estimated coal resources in that section of the Book Cliffs field are in excess of 21,000,000 tons.

There are five mining districts in the county—Little Graude, Miners' Basin, Richardson, Wilson Mesa and La Sal. In the Little Graude district manganese is the principal product. Copper is the predominant metal in the Miners' Basin area, although some gold placer mining has been done. Vanadium ores are characteristic of the Richardson district and placer gold of the Wilson Mesa. From the

La Sal district has been shipped copper ores carrying some gold and silver.

Moab is the center of what is probably the greatest carnotite belt in the world. It is the greatest yet discovered. Prospectors have been taking small fortunes in carnotite ores from the hills of Grand and San Juan Counties for several years. Just prior to and during the war some development of big proportions was undertaken and shipments were made with considerable regularity for a time. Since the war, however, the bigger operations have slowed down and the prospector is again the principal producer.

The carnotite strata are encountered about twenty miles south of Moab and continue about seventy-five miles southward. It is estimated that the carnotite area covers about 6,000 square miles in that section, of which about 3,000 square miles are in Utah. Carnotite ore contains both uranium and vanadium. The uranium is a bright canary yellow and has been used since time immemorial by the Indians for painting their faces and coloring their garments. Often it occurs in a decomposed form and is as soft as putty. The vanadium ore is a coal black. Both are easily distinguished by the experienced prospector. The values vary from \$80 to \$160 a ton. Little other than the ordinary prospectors equipment is necessary to work the deposits unless it is desirable to undertake a big development campaign. What systematic development may mean is reflected in an instance of not very ancient date, where a claim was sold for \$150 and under systematic development the same claim yielded ores valued at \$250,000.

Of more interest than all else in Grand County just now is the efforts of various companies and individuals to find oil in commercial quantities. That oil and gas existed in Grand County has been a matter of common knowledge for many years because of numerous oil seeps and discoveries of escaping gas. Oil prospecting has been undertaken at various times during the past twenty years, but nothing of moment was accomplished. About two years ago, however, some of the old oil prospectors of the district returned from successes in other regions and begun work. Their efforts have been watched with keen interest, attended by no little excitement, but as yet no accomplishment of importance has been reported. Activities have been stimulated not only by apparently promising oil conditions locally, but because vast tracts of a somewhat similar character in the neighboring counties have been set aside by the federal government as oil reserves.

Grand County is the mecca for the pioneer and the prospector.

IRON COUNTY

The greatest deposits of high grade iron ore in western America, billions of tons of bituminous coal, scores of thousands of acres of fertile agricultural lands available, and one of the finest grazing areas in the state—these are a few of the resources upon which Iron County is counting for future commercial supremacy in the intermountain region. Among other items expected to contribute liberally to her rise are some of the most striking scenic attractions in America, vacation retreats which include excellent shooting and fishing grounds, and the fact that her principal city is the gateway to Zion National Park.

When Parley P. Pratt explored the region the second year after the pioneers came into Salt Lake Valley he found the great croppings of magnetite and hematite iron in the mountains on the Escalante desert and instantly visioned a great industry which very naturally suggested the logical name for the political division to be formed embracing that section of the state. Iron County seemed especially appropriate and it stuck.

There was very little in the activities of those hardy pioneers which was not practical and their visions usually were in keeping with their practical training. Also, thought usually was followed by immediate action. When Mr. Pratt returned to Salt Lake to report his discoveries he recommended the opening up of the iron deposits west of Cedar City and of the coal deposits to the east; the establishment of a camp in the vicinity of the present town of Cedar City as the industrial center; the establishment of the town of Parowan in the Parowan valley and the cultivation of the surrounding lands to supply foodstuffs for the mining and industrial camps.

Iron ore was smelted probably for the first time west of the Mississippi River in a furnace within the walls of Cedar City in 1853. The plant was installed by the Deseret Iron Company, organized in England with a capitalization of \$20,000 and chartered by the legislature of Deseret on January 17, 1853. Two appropriations aggregating \$7,000 were made by the territorial legislature to aid the industry, but after about two years the plant was closed. That the initial efforts were not without some success, however, is indicated in the fact that the spikes used in the construction of the Salt Lake theater at Salt Lake City were forged from Iron County iron.

The iron field embraces three deposits, all apparently

connected, stretching from the Iron Springs district on the north through the Pinto district about the Washington-Iron County line, and down into Washington County to the Bull Valley district. The Iron Springs district is about 22 miles east of Lund, on the Los Angeles & Salt Lake railroad, and 12 miles west of Cedar City. The field in its entirety is about sixty miles long and a mile to a mile and a half in width and the tonnage of ore available is estimated at anywhere from 500,000,000 to 1,000,000,000 tons. Four hundred samples taken from various workings and croppings in the field show the ores to have an average metallic content of 59.64 per cent, equal to the best ores of the Lake Superior region. The comparative analyses of the Iron County, Lake Superior and Alabama ores follow:

	Utah	L. S.	Ala.
Iron (metallic)	59.64	56.46	37.00
Silica	7.00	9.60	13.44
Phosphorus .....	.154	.1246	.37
Lime and magnesia	4.00	1.30	16.20
Alumina	1.00	1.50	3.18
Water above 220	3.00	9.73	3.18
Copper .....	.027	.....	.....
Sulphur .....	.057	.019	.07
Manganese .....	.196	.....	.....
Carbonic acid .....	.....	.....	12.24

Vast deposits of bituminous coal exist in the mountains east of Cedar City and constitute the Colob coal field. The coal crops rather high up on the mountains from north of Cedar City at intervals to Kanarra, a little village on the southern rim of the Great Basin. The United States Geological Survey estimated about ten years ago that there were in excess of two billion tons of coal in the field, but more recent investigations made by the Utah State Geologist indicate that the survey estimate was entirely too conservative. The deposits have been opened up in a small way in a number of places to obtain fuel for local use and it was from this field that coal was obtained for the operation of iron smelting furnaces in the early days. Recent tests of the coal indicate that it is not a good coking coal and this shortcoming has been in a way responsible for lack of development of the iron deposits. The coal is a good

steam fuel and answers domestic needs **very well** in the southern country, and, with railroad facilities, it should find a ready market in southern California.

The need for a railroad has long been apparent and surveys from the vicinity of Lund to the iron and coal fields have been made on several occasions, but actual construction has not yet been undertaken. The distance from Lund to Cedar City is about thirty-five miles and across a comparatively flat country which presents no big engineering features and practically no heavy construction. The construction of such a line, which is now under contemplation, not only would open up the coal and iron fields, but it would bring railroad facilities 35 miles nearer Zion National Park and the famous Dixie country and stimulate the development of a vast area of agricultural lands. In the coal country there are large timber resources, a considerable share of the eastern part of the county being within the Sevier National Forest.

In this same section also there are extensive gypsum deposits, which have not been touched, and the Cedar Breaks region, one of the most spectacular scenic attractions on the continent. The formation in the Cedar Breaks territory is very similar to that at Bryce Canyon in Garfield County, but Cedar Breaks cover an area many times the size of that occupied by Bryce Canyon. The Cedar Breaks region is but little known to those outside the immediate vicinity because of its inaccessibility. About the only way to reach it is on foot or horse, but a good highway is being built from Cedar City into the Long Valley country in Kane County which will pass through the Breaks region and open up some of the timber resources of the section.

Practically all the county is ideal for grazing purposes. The mountains supply large herds of cattle and flocks of sheep with grazing facilities during the summer and the arid country to the west of Cedar City and clear to the Nevada line is an ideal winter range. In view of such highly favorable conditions it is not surprising that stock raising is the principal industry of the county. Iron County also has the advantage of its neighbors to the east and south in that its northwestern section is traversed by the Los Angeles & Salt Lake railroad. Lund is the principal railroad station in Iron County and it is the shipping point for most of the communities in Iron, Washington and Kane Counties. Among the more important towns in Iron County besides Lund and Cedar City are Parowan, the county seat, Paragonah and Enoch in the eastern part, and Nada, Modena, Beryl and Heist along the railroad.

Until within recent years agricultural development has been confined chiefly to the eastern part of the county in the vicinity of Cedar City, Parowan and Paragonah, all towns along the pioneer trail between Salt Lake City and southern California. In these sections water for irrigation was obtained from mountain streams, except in the Parowan Valley, where some artesian wells were brought in. Discovery of flowing wells in the country around Parowan encouraged considerable drilling and numerous other wells were brought in, but it was necessary to pump most of them. Test wells put down in recent years on the desert west of Cedar City has resulted in the discovery of an underground flow of water which will mean the reclamation of thousands of acres of land on the desert country between Cedar City and Lund. For the most part the farms in Iron County have consisted of large holdings, principally by stockgrowers who were interested chiefly in the production of hay and grain for winter feeding, and in having acreage for grazing purposes. The discovery of underground water undoubtedly will stimulate more intensive farming and probably the cutting up of the large land holdings to a considerable extent. Another item which means much to irrigation by wells is the extension of electric power lines into the farming communities, thereby making available cheap power for pumping purposes. In the vicinity of Parowan other efforts to increase the irrigated area are being prosecuted successfully. Near Parowan is Little Salt Lake, a small dead sea, the chief purpose of which has been to supply to some extent the salt needs of the section. Among the improvements contemplated and under way, is one to drain this dead sea and convert it into a reservoir for the storage of fresh water for irrigation. Dry farming has been carried on in some sections of the county with generally satisfactory results, but where water can be obtained at a reasonable cost the dry farms are rapidly being converted into irrigated ranches.

All hay and grain crops flourish in every part of the county where farming has been undertaken. The soil and climate also are adapted to the growing of the fruits common to the Great Basin region, but there has been no attempt to grow even as much as can be used locally because of the proximity of the Dixie fruit section. There are thousands of acres of fertile lands, some partially improved but mostly unimproved and in the public domain, awaiting the coming of more settlers and farmers. That agriculture is destined to play a far more important part in the affairs of the county and in that section of the state as a whole,

is indicated in the fact that the state government has seen fit to establish at Cedar City a branch of the State Agricultural College. Although a branch, it is a considerable institution in itself. While its purpose is to serve agriculture generally, its special purpose is to give particular attention to conditions in that section of the state. Besides carrying the message of scientific agriculture to the younger generations it is a material aid to the older farmers through the readiness of the members of the faculty to offer helpful advice and supervision.

Iron County is destined to become some day an important center for the iron and steel industry in western America as well as one of the great agricultural sections of the state.

JUAB COUNTY

Three great industries—mining, agriculture and stock-growing—reflect the character of the resources nature has bestowed upon Juab County to insure its prosperity. When the pioneers were cutting their modest farmsteads from the sage and planning the town of Nephi they learned that the bounties of nature were not confined to fertile soil and luscious grasses in that region within the shadow of majestic Nebo. From the mountainside they picked the raw materials from which they made plaster to make the rude cabins more homelike, and from the nearby canyons they obtained salt for themselves and their animals. Thus, the three great industries of the county got practically an even



NEPHI, JUAB COUNTY

Birdseye View

start insofar as time was concerned. But the real boom in the mining industry did not come until several years later, about 1869, when the original discovery of rich metal deposits in the Tintic section, west of Nephi, was reported.

Although the pioneers were quick to avail themselves of gypsum and salt deposits to add to their comfort, they were more interested in their farms and their live stock. They diverted the waters from the mountain streams and brought under cultivation the fertile lands of the valleys. In the summer they grazed their stock in the mountain forests and in the winter they grazed them on the desert,

providing the Indians did not interfere. And they do these things today, only on a much bigger scale and without fear of interruption by the Indians. But they do more also. Juab County is almost the home of dry farming in Utah. Until a comparatively few years ago it was believed the semi-arid region would produce profitable crops only by irrigation. The theory of dry farming was advanced. Nephi residents lacked water for irrigation of thousands of acres of fertile lands nearby. The theory of dry farming sounded interesting and they gave it a trial. Sixty-seven bushels of wheat to the acre on an average from a dry farm field started a new era of farming, not only in Juab County but throughout the semi-arid regions of the great west.

Development is confined largely to the eastern part of the county, both the farming district around Nephi—the county seat—and Levan, and the mines of the Eureka section being in that region. The western part of the county is heavily mineralized in spots, but that section is chiefly valuable as a winter range for sheep. The mountain forests in the eastern part furnish the finest kind of grazing for live stock during the summer.

By far the major portion of the county is in the public domain. With a total area of 2,245,120 acres, only about 225,000 acres of farming and grazing lands are in private ownership, according to the assessment rolls. There is a considerable acreage held as metal mining lands, either owned outright or held under the mineral location laws, but not nearly so much as comes under the ranch classification. Then, too, the Nebo National Forest occupies a limited acreage in the extreme eastern part of the county, but there are probably a million and a half acres unreserved and unappropriated, mostly in the western part.

The area under cultivation probably would not exceed 65,000 or 70,000 acres, fully half of which is cultivated by dry farming methods. While there are some ranches in the vicinity of Eureka and scattered through the western part of the county, the biggest agricultural development is in the vicinity of Nephi and Levan. Some water has been obtained from the mountain streams for the irrigation of small areas and efforts have been made to obtain water from the Strawberry project but as yet nothing in this direction has been done.

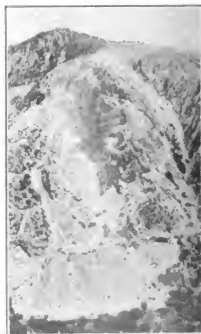
The assessment rolls for the year 1920 shows 67,360 acres of improved farming lands with an average value of \$32.33 an acre; 50,507 acres of unimproved farming lands with an average value of \$9.56 an acre; and 107,509 acres of grazing lands with an average value of \$5.22 an acre.

Approximately 44 per cent of the lands cropped this season were under irrigation. In addition, there were about 20,000 acres of dry farm lands under fallow for next year's crops. The crop reports indicate there were 1,050 acres in corn, 922 acres in oats, 368 acres in barley, 3,000 acres in rye, 16,000 acres in winter wheat, 1,700 acres in spring wheat, 350 acres in potatoes, 500 acres in sugar beets, 7,966 acres in tame hay—principally alfalfa—and 3,200 acres in wild hay. The average yield of winter wheat was about 14 bushels to the acre; spring wheat, 15 bushels; oats, 44 bushels; barley, 31 bushels; corn, 21 bushels; potatoes, 150 bushels; alfalfa, 3.15 tons; rye, 9 bushels, and wild hay, about a ton to the acre. Rye and winter wheat are the principal crops grown without irrigation, although some of practically all varieties of grains and hay and some vegetables and fruits are raised on dry farms. The country around Nephi and Levan is well adapted to dry farming and development has been stimulated considerably because of the establishment near Nephi of an experimental station of the Utah Agricultural College. The purpose of the station is to try dry farm methods in the cultivation of the various grains, hays and other products. The experiments have been of deep interest not only to the residents of the section and of the state as a whole, but has attracted the attention of distinguished agriculturalists from various parts of the world.

The livestock of the county is valued on the assessment rolls this year at approximately \$1,500,000, of which the 115,000 sheep represented about a million dollars and the 10,000 range cattle represented about \$325,000. The opportunities for dairying are promising in the county but the industry has not been developed to any extent as yet.

The big money maker of the county is the mining industry, principally metal mining, which is conducted on a big scale in the Tintic district west of Nephi and surrounding the town of Eureka. Some of the famous mines of the west, past and present, are situated there and to date the camp has produced approximately \$200,000,000. And it still is producing at the rate of about ten million a year. The discovery of lead carbonates rich in silver and the staking of the Sunbeam claim in 1869 was the starting of the camp. Shortly afterward the famous old Mammoth and other great producers were discovered and the ores were mined and hauled nearly thirty miles to the railroad and shipped out of the state for smelting. After a while the railroad came to the camp and it was possible to work

profitably the lower grade ores. Some of the older mines are still producing and new ones are added almost every year. There probably are more metal properties under development in Tintic district than in any other region in the state. To the north and to the west in the same range of mountains some very promising properties are being developed and the indications are favorable toward both sections figuring conspicuously among the producing districts. The western part of the county contains a great amount of mineral, but lack of rail transportation has seriously hampered development except of occasional rich pockets. In the south central part of the county is the old Detroit district; in the northwestern, the Fish Springs district and in the west is the Trout Creek region. Fish Springs and Detroit are old producers and are still being worked intermittently, and some interesting discoveries have been reported in the Trout Creek country.



OUTCROPPING OF GYPSUM
Juab County

The gypsum deposit opened up just east of Nephi by the pioneers to get materials for plastering their cabins has been developed in recent years to one of the most important plaster producing concerns in the western country. The gypsum is of exceptional purity and in great

quantities and since the Nephi Plaster Company was organized and took charge of the operations it has become a decidedly profitable industry. The quality of Nephi plaster is known throughout the western country and various sections of the east, and some of it has won recognition in foreign lands. The most notable effort of the company was to supply the material for the scores of beautiful buildings at the Panama-Pacific International Exposition at San Francisco a few years ago. The walls of all the buildings there were made of Nephi plaster, tinted to suit the demand. It is a product of high quality and with favorable transportation rates would permit it to be marketed on a scale that would stimulate further development of the vast gypsum deposits in that vicinity. What appears to be the same deposit outcrops a few miles farther down the mountain range near Levan. A company was organized and the deposit opened up several years ago, but because of the overland haul of ten or twelve miles to the railroad it was not possible to meet competition and the plant was closed down.



NEPHI PLASTER MILL
Juab County

In the early days some salt was mined up Salt Creek Canyon east of Nephi, but the properties have been sold by the original owners and the purchasers have suspended operations.

Juab is one of the counties with fairly good transportation facilities, reasonably close to markets, with good lands at reasonable prices and untold mineral resources, that is standing on the threshold of a new era of development.

WEBER COUNTY

The mere suggestion of the name of Weber County immediately brings to mind Ogden, the county seat and second city in Utah and which is rapidly gaining recognition as the manufacturing city of the intermountain region. Weber County is comparatively small as counties go in Utah, its total area being only 694 square miles, approximately 150 of which are covered by waters of Great Salt Lake. Its land area is pretty evenly divided between mountains and lowlands. A large share of the lowlands are included in the Great Salt Lake Valley and the remainder are fertile and well watered mountain valleys and foothills or mesas. Large land holdings in the agricultural section are exceptional, most of the holdings being in the shape of small farms tilled by the owners and forming one of the most intensively cultivated sections of the state.

The mountainous area of the county is principally valuable for grazing purposes and have an average market value of about \$10 an acre. Unirrigated mesa lands are valued at approximately \$75 an acre, while improved irrigated lands for intensive farming average about \$350 an acre in market price. Water for irrigation purposes is supplied for the larger portion of the valley lands from the Ogden and Weber Rivers and smaller streams, but by the storage of flood waters and the construction of new irrigation systems a large area of higher lands also can be furnished a full water right. To accomplish this, it was voted recently by property owners to form an irrigation district, store the flood waters and reclaim approximately 45,000 acres more land. There are some lands in the Salt Lake Valley which will require other methods to reclaim. Thousands of acres in the lowlands of Weber County are waterlogged and are valuable for pasturage, affording revenue on a valuation of about \$100 an acre. When water for irrigation is available the waterlogged lands can then be drained and devoted to the growing of canning crops, which yield big returns in this section.

The soil and climate of Weber County are adapted to the culture of fruit, truck and canning crops, sugar beets, early potatoes, hay and grain. The annual income from agricultural products is estimated at approximately \$4,000,000, most of which are turned to manufactures in the vicinity and take on an added value of about \$6,000,000 on the market. Within recent years the majority of the grain and hay crops have been supplanted by sugar beets,

tomatoes, peas and other crops for canning, more than doubling the financial returns. This evolution has been responsible for the application of dry farming methods to unirrigated lands formerly devoted to grazing and the results generally have been highly satisfactory.

In Weber County this year there are approximately 11,000 acres planted to sugar beets which will yield the farmers in the neighborhood of \$1,500,000. There is a sugar factory at Ogden and one at Hooper, which will cut beets from about 15,000 acres, a portion of the supply being received from neighboring counties. Since none of the agricultural lands of Weber County are more than five or six miles from a steam or electric railway, the sugar companies have dotted the country with beet loading stations, thereby reducing to the minimum the farmers' expense of hauling to market.

Peas and tomatoes are the staple canning crops of the district. The tomatoes are of a very high quality, meaty and firm in texture and of an unusually rich color. Large quantities of Weber County tomatoes are shipped east each year to be used in the manufacture of catsup. Cannery operators situated in or near Ogden have learned that the peas grown in the higher valleys are of a superior quality and to facilitate the handling of the crop and stimulate production they have established numerous substations throughout the county for the separation of the peas from the vines before sending them to the canning factories. During the season about 50 tons of shelled peas are moved daily from the farms in the higher valleys through Ogden Canyon to the canneries in the lower country.

Because of its excellent transportation facilities Ogden has attracted many manufacturing enterprises, especially manufacturers of foodstuffs. It is a junction point for the Union Pacific, the Southern Pacific, the Oregon Short Line, the Denver & Rio Grande, the Bamberger Electric and the Utah-Idaho Central interurban. In addition to the railroads it has hard surfaced highway connections with Salt Lake City on the south and Brigham City and Cache Valley points on the north.

The canneries represent the initial effort in a manufacturing way and the industry has flourished and stimulated intensive farming. There is no inclination at this time to encourage further canneries as the plants are able to care for the crops grown and the companies are ready to expand as rapidly as production will justify. The canning industry and the transportation facilities have com-

bined to attract plants for the manufacture of containers. Including cans for condensed milk, there are approximately 60,000,000 cans used annually in the section, and the candy and cereal foods afford a market for about 2,000,000 cases and boxes each year. Fiber and corrugated boxes are gradually displacing wooden boxes for shipping products packed in cans, cartons or paper boxes. To care for this business the American Can Company and the Keickhefer Box Company have established branch factories at Ogden.



ONE OF THE FLOUR MILLS
Ogden, Utah

Within the past two years strong companies handling and milling grain have erected big plants at Ogden which make it the milling center of the intermountain region. At present the grain exchange is situated in Weber county and all grain shipped in the intermountain country comes through Ogden, where there is a storage capacity of more than 2,000,000 bushels and the mills are capable of turning out more than 6,000 barrels of flour daily in addition to the cereal and stock foods.

Transportation and other favorable conditions have contributed liberally to Ogden's claim for recognition as the center of the livestock industry in the intermountain region. Three or four years ago the so-called stock yards consisted of half a dozen or so pens to care for through shipments, and there was no local market for anything in the way of live stock. Now it has a yard which is about the last word in stockyard construction. The sheds and pens are of heavy construction with concrete floors, complete water and sewerage systems and splendid drainage. Seventy-eight thousand carloads of stock were handled through Ogden yards last year, and as many as 10,000 head have been handled in one day without confusion. Six livestock commission firms have established offices at the yards. Adjacent to the stockyards is the Ogden Horse Sale Commission Company, which supplied the United States and its allies with 65,000 head of horses during the war.

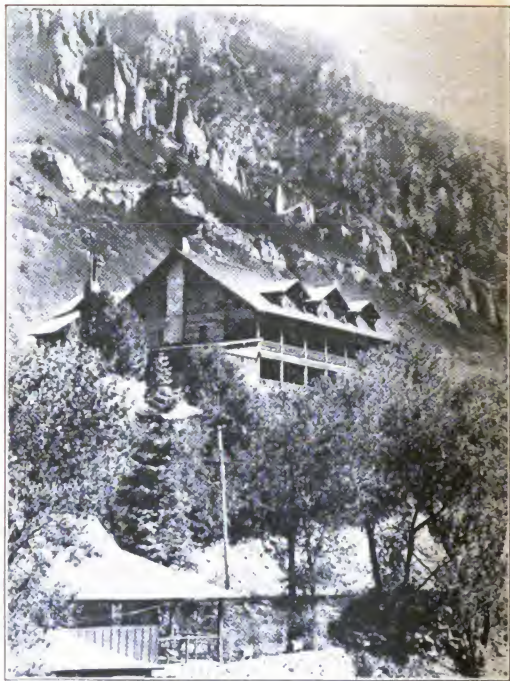


OGDEN UNION STOCK YARDS
Weber County

The packing industry at Ogden has enjoyed a growth rivaling that of Omaha in its early days. The same conditions that caused the growth of the packing industry at Omaha prevail at Ogden. On arrival with his stock

the shipper car, sell on the Ogden market or he can go on to Omaha without loss of time or additional freight charges beyond what he would have encountered on through shipment. Other points in Utah may share equal advantages in the matter of freight charges, but there is a loss of time which is important as every day's delay to live-stock in transit means a reduction in weight and probably in value of the shipment. Omaha is so located that the Nebraska farmer buys and fattens stock for the packing plants. Ogden has a similar condition in the Utah Milling & Feed Yards, which manufactures stock foods and provides yards for the fattening of stock arriving in poor condition. This plant makes the stockgrower reasonably sure of a market and assures the packing plant of a supply of fat stock.

But while Weber County is a center of industry and commerce, it also includes among its resources some mountain scenery of rare beauty. The principal attraction of this character is Ogden Canyon, immediately back of the city, with its hundreds of beautiful summer homes and the attendant resorts which are accessible by motor car over highly improved highways and by interurban line. The canyon is a narrow gash in the mountains and bordered by rugged and majestic cliffs and peaks, while along the floor is the beautiful Ogden River, inhabited by the elusive and gamey trout. It is an ideal section for rest and recreation, and Weber County residents, realizing the value of pleasure as an asset to business, are inclined to make the most of their opportunity.



THE HERMITAGE
Ogden Canyon

KANE COUNTY

Before interest in the Grand Canyon developed the sentiment for a north and south highway through the central part of the state to its southern border, people of Salt Lake City and northern Utah listened to mention of Kane county with about as much enthusiasm and knowledge as though some foreign land in which they were not concerned was under discussion. Even yet, people of the northern part of the state and Kane County are not acquainted, but at least they have been introduced. The highway to Bryce's Canyon and the Grand Canyon has established a line of communication that makes even the citizens of Kane forget that they are from 90 to 150 miles from a railroad. And when the new road through Cedar Breaks into Long Valley and the proposed road between Zion and Grand Canyon National Park is completed, nobody in Kane County will care particularly how far they are from a railroad insofar as being neighborly is concerned.

Because of carefully planned and efficiently executed publicity campaigns covering a period of years, the people of the country had learned to think of Arizona and the Grand Canyon in the same breath and to consider the Grand Canyon as a strictly Arizona institution. It is true that the great gorge is in Arizona, but the exploratory efforts of inquiring motorists, supplemented by the road building activities of the United States Forestry Service, revealed to the world that the finest views of the Grand Canyon were from the north rim and that the north rim was accessible by motor car through Kane and Washington Counties in southern Utah. It also was brought out that the pleasures of a visit to the north rim of the canyon were augmented in no small degree by a fifty-mile drive through the wonderful Kaibab forests, one of the great bodies of standing timber left in western America. The motor explorations of the section were made only a few years ago, but they stimulated highway construction and improvement and were sufficient to divert in that direction a volume of motor tourist traffic that is growing bigger each year. Thus, people from the outside are becoming acquainted with Kane County and to appreciate its possibilities.

Although several slices have been taken from its territory since it was created a political division of the state, Kane County still is larger than several of the New England states. It has an area of 4,373 square miles, or 2,-

798,720 acres, about two-thirds of which is unsurveyed and much of it practically unexplored. If the assessment rolls are acceptable as a reflection of conditions, less than 100,000 acres are in private ownership and only about 15,000 acres are under cultivation. But there is little incentive at present for a big farming acreage in Kane County, even though it were available, as the situation of the section in relation to transportation and conditions generally are so favorable to stock raising as naturally to make it the principal industry. Even that cannot well take on imposing dimensions, for, in a country practically unexplored, it is to be expected that the population will be small and scattered. It does, however, boast of the largest goat herds



GRAND CANYON FROM BRIGHT ANGEL
North Rim Reached from Kanab, Kane County.

in the state and the farmers find goat growing a very profitable industry. The number of sheep in the county averages about 110,000, and cattle 10,000 to 15,000. Since the advent of the parcel post and motor vehicles, the dairying industry has been yielding good returns to Kane County ranchmen. The cheese produced in that section is of an excellent quality and finds a ready market in the cities.

But because the agricultural acreage is small it must not be inferred that farming is not possible or profitable. Although the county is largely mountains and plateaus, it has some rather extensive and exceedingly fertile valleys. Where water is available without too heavy an expense, irrigation is practiced, but dry farming methods have yielded very satisfactory results generally. On the higher lands

in the vicinity of Alton, where the average annual precipitation is in excess of 20 inches, yields of 40 bushels of wheat and 70 bushels of oats to the acre on dry farms are not uncommon. In the lower country around Kanab the precipitation averages about 14 inches, the dry farm yield is about half that at Alton. As to potato country it probably cannot be excelled in Utah as the average yield is about 250 bushels to the acre.

Aside from around Kanab, the county seat, the development of the county is most advanced in Long Valley, near the headwaters of the Rio Virgin. The valley is about twenty miles long and probably averages a mile in width. Along the river are the towns of Glendale, Orderville and Mt. Carmel. Besides being an agricultural section, Long Valley is in the timber district, the Sevier National Forest extending down from Garfield County. To afford this section a more direct outlet to the railroad and to make available the timber resources, a highway is being constructed across the mountains from Cedar City, in Iron County. This road also will make accessible another of the great scenic attractions of southern Utah—Cedar Breaks—and some of the vast coal deposits of the Colob Plateau.

The Colob field embraces a large area around the corners of Kane, Iron and Washington Counties, and is estimated by the United States Geological Survey to contain in excess of 2,682,000,000 tons of coal. The deposit has been opened up at various places in Kane County to supply local needs. The coal is of fair quality, bituminous to sub-bituminous in character, and occurs in veins from a few inches to about seven feet thick. In this field near the headwaters of the Rio Virgin a vein of cannel coal more than five feet thick has been discovered. Because of the inaccessibility of the cannel deposit, very little exploratory work has been done and its extent is unknown. Some recent tests made by the Geological Survey indicate that the coal is high in petroleum, the samples submitted for test yielding at the rate of about 90 gallons to the ton.

In addition to the Colob field, Kane County has the Kanab field, which is the eastern continuation of the Colob and generally more accessible. The coal is of about the same character as that in the eastern part of the Colob field and has been opened up in several places to care for the local demand.

That there are oil possibilities in Kane is indicated by the withdrawal by the federal government of thousands of acres as oil lands. The Kane County lands were withdrawn along with some in Washington County and northern Ari-

zona, the development of all of which was made possible by the enactment of the oil leasing law.

Development in the county has been confined almost exclusively to the western half. The eastern part of the county not only is undeveloped but it is almost unexplored. Pahreah, near the junction of the Paria River and Cottonwood Creek and just about the center of the county, and Arizutah, a few miles to the south, are the most eastern settlements in the county of importance. East of them is the Kaiparowits Plateau, a country which affords a rare treat as well as some hardships for the geologist, the prospector and the explorer.

In the vicinity of Pareah and farther east, along the Colorado River, some gold discoveries have been made but mining has not proved profitable so far. In the mountains near Pahreah some very rich copper ore has been found but the records do not indicate any extensive mining operations or shipments.

Considering the sparse and scattered population, Kane County has a very good school system. Kanab has a model high school, the building for which was completed only recently and embraces the modern ideas for structures of that character. Kanab, too, is the most important town in the county, not only because it is the seat of county government, but because it is the gateway and a very important control for tourist traffic to Grand Canyon National Park. And a visit to Grand Canyon National Park by way of the northern gateway is only a part of one of the greatest circle tours to scenic attractions in America, embracing Yellowstone National Park, Great Salt Lake, Fish Lake, Bryce's Canyon, Grand Canyon National Park and Zion National Park.

MILLARD COUNTY

When Brigham Young stood on the steps of the old red sandstone statehouse at Fillmore more than half a century ago and predicted that Millard county some day would be the granary of Utah, conditions then existing appeared to justify the attitude of the scoffers. The country on which he gazed was a sage covered desert stretching northward from the old-time capital city, a vast and almost treeless expanse which had been given the name of the Pahvant Valley. But in this, as in other predictions and plans bearing on the development of Utah, the pioneer leader proved himself a man of wonderful foresight and vision. For today waters are gushing forth in the Pahvant Valley and the vast expanse of sage covered desert is being transformed into green and productive fields and Millard County is moving rapidly in the direction of the granary of Utah.

Millard County may have undiscovered mineral resources of great value; in all probability she has. Her diversified area furnishes grazing lands of high quality both winter and summer and the live stock industry has flourished. But the greatest wealth and her greatest value lies in the enormous acreage adapted to agricultural purposes. That the advantages in this direction are becoming recognized more rapidly each year is indicated in the farm census taken by the federal government in 1920 which showed that Millard County had increased the number of farms within her borders by nearly 50 per cent during the past ten years regardless of the lure of the cities and of the call to arms that have taken countless young men from the fields during the past four years.

Millard County is about 100 miles long east and west and about 60 miles wide north and south, embracing 4,335,360 acres or considerably more than the combined areas of Connecticut and Rhode Island. Through irrigation development the farming acreage has been more than doubled during the past four years and now totals 345,584 acres as against 8,164 acres listed as grazing lands in private ownership. This acreage of grazing lands, however, does not reflect the status of the livestock industry, which last year represented a valuation of \$4,209,380, an increase of approximately 100 per cent in the last four years. The biggest increases in the live stock industry from 1916 to 1919 were in sheep growing, the number of head increasing from 182,783 to 282,244, and the value from \$1,073,809 to \$2,872,125. The remarkable increase in farming acre-

age was due chiefly to development of irrigation water by construction of reservoirs and canal systems and by tapping underground flows. In some sections, however, dry farming is quite a factor and is being conducted with very satisfactory results, but dry farms are being turned into irrigated farms as rapidly as water is available. In 1916 there were 170,541 acres of farming lands shown on the assessment rolls with a valuation of \$3,834,883, and in 1919 the farming lands on the assessment rolls aggregated 345,584 acres, with a valuation of \$6,602,903. Western Millard County is mostly what is termed a desert country, while the eastern part of the county, which includes both the Delta and Fillmore districts, is being brought under irrigation and cultivation very rapidly and is one of the choice farming sections of the state. The desert country to the west is given over largely to grazing purposes and most of it still is in the open range or public domain. The desert region is adapted especially to winter grazing for sheep, while in the eastern part of the county excellent summer grazing is found in the mountains and in the Nebo and Fillmore National Forests.

The eastern part of the county is divided into two agricultural sections, the Delta and Fillmore, but the gap is being rapidly closed until within a few years it will be all in one big farming area. The reason for this apparent division in the eastern section is that the pioneers built their cabins close to the mountains where timber and water were available, and then when the railroad came through it chose the line of least resistance without any definite ideas concerning farming lands or water for irrigation. Millard County was settled shortly after the pioneers came into the Salt Lake Valley. The approach of Johnston's army sent the population in the northern part of the territory scurrying southward and the territorial capitol was transferred from Salt Lake to Fillmore, where it remained long enough for the erection of a state house and one session of the territorial assembly. Other towns in this section are Holden, Meadow and Kanosh, all of which are prosperous communities.

The older settlements served by the railroad are Oasis, Deseret, Hinckley and Abraham, all within a radius of a few miles, the settlement of the region having been influenced largely by agricultural possibilities. The same influence was responsible for the establishment in recent years of the towns of Delta, Sutherland, Woodrow and Lucern, all of which are within a short radius and in the same region as the older settlements of the Oasis group.

Water for irrigation of the old settlements in the Fillmore region is obtained from mountain streams, or has been until recently. The district along the railroad obtains its water supply from the Sevier River by the construction of a mammoth reservoir in Juab County. Various companies have joined in the construction of the dam, including the Deseret Irrigation Company with 12,000 acres; the Abraham Irrigation Company with 10,000 acres; the Melville Irrigation Company with 6,000 acres; the Midland Company with 2,400 acres; the Delta Land & Water Company with 32,000 acres, and the Sevier River Land & Water Company with 66,000 acres. The 32,000 acres of the Delta Land & Water Company are divided between the north and south tracts. The south tract is tributary to Oasis and Delta and the north tract to Delta, Woodrow and Sutherland. The tract of the Sevier River Land & Water Company stretches from Lynndyle south to Delta, largely mountain slope land. It is through the latter company and by the bringing in of some of the biggest artesian wells in the west that the additional acreage in the vicinity of Holden, Fillmore and Meadow is being brought under irrigation.

While fine fruits and vegetables and high grade grains are grown in Millard County its most noted and probably its most profitable crop is alfalfa. Millard County alfalfa is recognized by experts as being of superior quality and Millard County alfalfa seed is in demand throughout the country. One-half of all the alfalfa seed raised in Utah comes from the Pahvant Valley. There was recently shipped from Oasis \$600,000 worth of alfalfa seed. On a single farm near Fillmore last year there was produced \$50,000 worth of alfalfa seed. Yields during the past season ranged from eight to nineteen bushels per acre, netting the farmer from \$160 to \$360 and thereby paying 5 per cent on land values all the way from \$3,200 to \$7,200 an acre.

In the Oasis district the land is low and in some instances it has become waterlogged through seepage from the higher grounds. Steps already are being undertaken to overcome this evil by the installation of drainage projects under the supervision of federal or state government authorities.

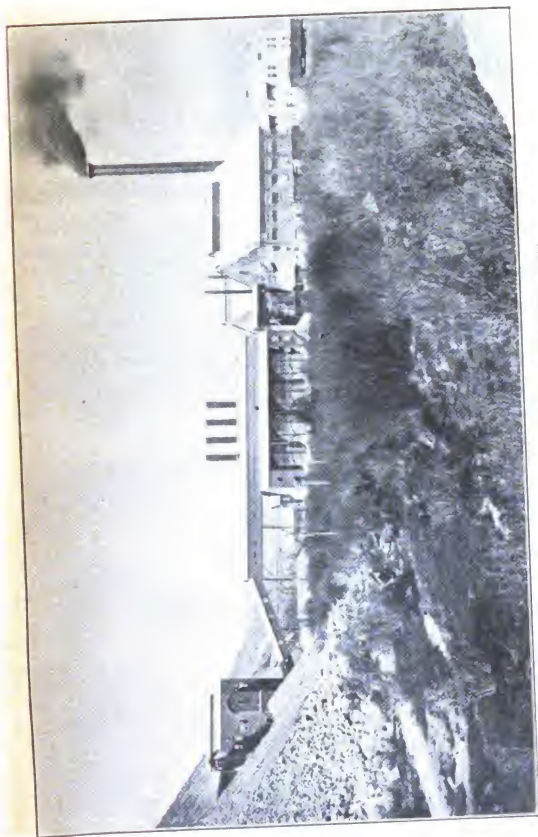
The operations of the Delta Land & Water Company were responsible for the founding of the town of Delta, which is now only about ten years old and probably the biggest town in the county, with the possible exception of Fillmore. Its growth was like that of a mushroom as the settlers moved in from all parts of the country and, under

the direction of competent engineers of the Delta Land & Water Company, began to turn the desert land into productive farms. From the start alfalfa was the favorite crop and its culture did much to stimulate hog raising. Later some experiments in sugar beet culture were so satisfactory that a beet sugar factory was erected at Delta and it has been in operation now for four or five seasons. The early estimates of the sugar beet production this season was in the neighborhood of 100,000 tons, but it is probable that this is considerably high.

About four or five years ago the first artesian well was brought in near Fillmore. Since that time nearly three score wells have been brought in to supply water for irrigation purposes and thousands of acres have been put under cultivation. The extension of the canals of the Sevier River Land & Water Company also has added about 30,000 acres to the list of cultivated lands in the Holden region. And still only a comparatively small fraction of the lands susceptible to cultivation in the Pahvant Valley are being worked.

One handicap under which the Fillmore-Holden section has been laboring all these years is lack of transportation. On several occasions efforts have been made to build a branch line from the vicinity of Delta eastward as has been done to the west and north to open up the farming country, but as yet nothing in the way of construction has been accomplished. In an effort to overcome this, however, good highways are being constructed to connect the principal railroad towns with the inland communities. Already there is a good highway between Fillmore and northern Utah cities that is serviceable for motor vehicles practically the year round.

Lynndyl is a division point on the Los Angeles & Salt Lake railroad and also is under the Sevier River Land & Water Company's project. The agricultural possibilities there appear to be about the same as in the other sections and some remarkable developments are expected within the next few years.



UNION PORTLAND CEMENT PLANT
Devil's Slide, Morgan County

MORGAN COUNTY

Although Morgan County may find it difficult to refute the charge that it is the smallest county in the state, it can boast of two of the largest individual industries in the commonwealth. It might go a little further without successful contradiction and assert that one of these industries not only is the largest of its kind in the state, but the largest in the United States and possibly the largest in the world. The two individual industries of which Morgan County is justly proud are the Union Portland Cement Company at Devil's Slide and the pea canning plant of the Morgan Canning Company at Morgan, the county seat. The cement plant at Devil's Slide is the biggest factory of the kind in the state and the pea canning plant at Morgan, according to information available, is the biggest pea cannery in the United States and probably in the world. While in the matter of annual returns the cement industry means more to the county than that of pea canning, still it is to the tiny vegetable that Morgan County attributes mostly its fame. For wherever tinned goods are in common use the Morgan County pea has made its way and won a reputation for quality that is excelled by none.

The entire area of the county is but 407,744 acres, of which approximately 100,000 acres are included under the general characterization of farming lands, although less than 20,000 acres are now under irrigation. To insure an adequate supply of water for a greater acreage there has been organized recently an irrigation district which contemplates the construction of reservoir facilities for the storage of the flood waters of the Weber River. Not all of the 100,000 acres designated as farming lands are under cultivation, although dry farming is practiced very successfully in many instances. In fact, about 90 per cent of the lands of the county can very properly be called grazing lands.

As has been intimated already the four chief lines of endeavor in Morgan County are cement manufacture, vegetable and fruit canning, farming and stockgrowing. The cement industry has assumed gigantic proportions. The plant at Devil's Slide is one of the most modern in the country and is electrically operated throughout, power being generated on the premises. The plant has a production of 2,000 barrels of cement daily and its storage facilities aggregate 50,000 barrels. The plant is situated in a small canyon near the Weber River and is served by a spur from

the main line of the Union Pacific railroad. The plant was the second Portland cement plant erected in the state. Lime and shale are the raw products used in the manufacture of the product and both occur in practically unlimited quantities in the section where the plant is situated. A model little town has been built up a short distance down the canyon for the accommodation of the employes at the plant. And nearby is situated that rather unusual piece of nature's handiwork from which the town derived its name—the Devil's Slide.



DEVIL'S SLIDE
Morgan County

But the homeseeker is more interested in the possibilities for development, probably, than in the established industries. The biggest opportunities are to be found in farming and stockgrowing, chiefly in the former. Although peas are an important product and have won deserved prominence, other prolific crops in the vegetable line are cabbage, cauliflower, pickling onions and tomatoes. Morgan potatoes are famous throughout the state and for many years the county has held the record for production per acre. The soil and the climate are particularly adapted to the growing of vegetable crops common to the intermountain country.

The lands are too rich and too high in price to encourage the growing of grain and hay where water is available for irrigation. Grain is a profitable crop on dry farm lands and the yield of wheat sometimes is as high as fifty bushels to the acre. Excellent fruits are grown in the county, especially apples, pears, plums and garden berries.

Last year there were 600 acres of peas grown in the county and the total production was 1,050 tons, or an average yield of 1.75 tons to the acre. The average cannery output is 95 cases of 24 cans each to every ton of peas, making the canned pea production for the year approximately 100,000 cases, or 2,400,000 cans.

Some instructive information concerning the pea growing industry is furnished by Professor M. C. Merrill of the Utah Agricultural College, who said in part:

"The canning pea of Utah is gradually extending its domain and its influence for good. And it is well that it should. It makes a good respectable neighbor in any hay fields. It exacts little and returns much.

"During the past few years the multiplication of sugar factories has necessitated an ever-increasing amount of land in beets. In many cases too large a proportion of the farm has been devoted to beets year after year, and as a consequence there has not been that well balanced rotation that is best for the farm in the long run.

"In those sugar beet areas where canneries have been available (and this is the usual conditions, for sugar beet factories and canneries go hand in hand exceedingly well), the canning pea crop has been a great asset to the farmer by furnishing him an excellent rotation. This has been exemplified in numerous instances of late years. For illustration, this past summer the writer saw many fields of beets growing on land that was planted to peas the preceding season. The contrast was striking and the lesson one that should be remembered. In every case where such conditions prevailed the beets were far better on the land that had been in peas.

"Where the conditions for pea growing are favorable, the financial returns range all the way from \$60 to \$150 an acre. On a plat of 1.8 acres at the college \$196.38 worth of canning pea seed has been produced. When one considers the small amount of work required to grow and harvest a crop of peas as compared with some other crops, it is seen that the net returns are very satisfactory.

"But now there are some limitations to the profitable production of peas for the cannery. Among the most important of these are the temperature, the area, the cultural

requirements and the variety. The pea is a cool season crop and does not thrive well where the temperature is too high. It is well adapted to Utah's valleys, but the mistake is made too often of planting too late. The area planted to peas should not be too large to be properly handled at harvest time. The peas must be gotten to the vinery at just the proper time. As to culture, the pea thrives in a variety of soils. The seedbed should be prepared and irrigation is of particular importance. The water must be applied at the right time and in the proper quantity. One very common mistake is to irrigate too much, causing the peas to ripen prematurely. The variety should be well chosen but usually the cannery does this for us."

Another vegetable grown extensively for canning in Morgan County is cabbage, which is manufactured into kraut. There were 50 acres planted to cabbage last season and the yield was 500 tons.

Good plow lands in the county are valued at \$250 an acre, according to the estimates of the United States Bureau of Crop Estimates for March, this year. Poor plow lands are valued at \$95 an acre, while the average for the county is given as \$150 an acre.

The mountain lands are covered with an abundance of rich and nutritious grasses, affording excellent opportunities for the dairy industry which is only partially developed. Some creameries are now in operation and some of the larger companies operate in the section through branch or shipping stations. Probably some of the most promising opportunities in the county are in connection with the development of the dairy industry.

The hills are well supplied with good growths of pine and aspen, and trout and other fish abound in the streams. Thousands of tourists and sportsmen visit the county during the year and find it one of the best fishing sections of the state. Deer abound in the hills and wild chickens are reported to be more plentiful in Morgan County than in almost any other section of the state.

Mineral development has been neglected in the county, probably because of the fame of the established camp of Park City in the neighboring county of Summit. Some promising mineralized areas have been found and prospected to a limited degree. The phosphate zone passes through a portion of the county, but this resource, like others in the mineral line is awaiting development.

PIUTE COUNTY

When the British blockade stopped German shipping in the latter part of 1914 the probability of a serious potash shortage caused serious apprehension among the agricultural interests of the country. And there was good cause for apprehension because practically all the twelve million dollars worth of potash consumed annually in the United States came from Germany and insofar as was generally known the American potash resources were negligible and successful methods for production in a commercial way were nil. By the following spring the Federal Government had its experts scouring the country for raw materials and its chemists working overtime in an effort to develop satisfactory processes for the manufacture of potash. It was about this time, along in 1915, that Piute County sprung a surprise for America and the world, in the form of a shipment of twenty-eight tons of American-made potash.



POTASH PLANT, ALUNITE
Piute County.

Potash from a pink spar called alunite was the answer. The initial shipment of potash soon was followed by more and all during the war period, except the period when the burned plant was being rebuilt, a steady stream of potash was moving from Marysville to fertilizing and munition manufacturing centers. The production of Piute county was not sufficient to meet the potash demand by any means but it helped materially and stimulated further exploration

and investigation. And today the manufacture of potash is one of the principal industries of the county.

The reputation of Piute County as a mining center was in a sad state of repair when Tom Gillan tucked a few pieces of pink spar into his grip about ten years ago and set out for Salt Lake City. Veterans of the district wagged their heads knowingly and their comments were anything but encouraging, for hadn't they tried samples of that same pink spar for metal values years before, and hadn't they seen tenderfeet meet with similar disappointment almost every summer? In the eyes of the miners the only redeeming feature of the pink spar, which was so abundant in the region, was that it was not difficult to bore through in the search of more valuable minerals.

But there was a hurried change in feeling when Gillan and Custer plastered the south hillside in Little Cottonwood canyon with location notices, and the secret leaked out that the pink spar was alunite running high in potash and aluminum. Interest soon altered to excitement and when the Mineral Products Company began the construction of the first potash plant there was a full-grown stampede for alunite ground in Piute County, and the old camp of Marysville was in the throes of an old-time mining boom.

Omitting symbols and fractions, alunite contains sulphuric acid 38 per cent, water 13 per cent, potash 10 to 13 per cent and alumina 35 to 37 per cent. Some of the ores in Piute County carry a lower potash content and some considerably higher but the alumina content is about stationary. About two-fifths of the alumina is metal aluminum, or roughly, about 280 pounds of aluminum to the ton of ore. The development of the alunite industry would be stimulated considerably if some process could be worked out which would permit the production of metal aluminum in a commercial way. The construction of the original plant of the Mineral Products Company about seven miles south of Marysville built the new town of Alunite, and if metal aluminum can be produced profitably there will be half a dozen or more camps similar to Alunite spring up almost overnight. Following the signing of the armistice there was a big sag in potash prices which brought about the suspension of activities at practically all the alunite camps in Piute County. The lull at Alunite, however, was only temporary. Certain qualities of the potash produced there are especially adapted to tobacco culture, qualities not found in German or other American potash, and the demand is so great that the plant at Alunite soon was reopened and has been working at capacity since. The de-

velopment of the vast deposits of alunite is only in its infancy and its progress probably will be slow until some use is made of the alumina or until potash producers are confident that they can meet foreign competition.

The alunite excitement was not Piute County's first experience with mining booms. As early as 1856 gold was discovered in the gravel of Pine Creek near the site of the present town of Marysville. The find was kept secret, however, until about 1869. In that year a party of prospectors tried panning the Pine Creek gravel and ultimately discovered the Webster mine and precipitated the first mining boom in the section. Half a dozen or more famous old properties were worked about this time, all of which, except the Deer Trail, have been abandoned or are worked indifferently. Along in the early '80s a rich gold strike was made in the Gold Mountain section and the camp of Kimberly was born. The Annie Laurie was one of the famous producers in this section and was worked within recent years. The total production of the Gold Mountain district is estimated by the Geological Survey to be approximately \$3,250,000. The Ohio and Mount Baldy districts are south of Gold Mountain and include several famous properties, some of which still are operated intermittently. The production records of these districts are far from complete but the figures available show an aggregate output of about \$210,000.

The most highly mineralized section of the county is in the Tushar range, one of the majestic and really beautiful mountain ranges in the state, and the highest range in southern Utah. Among its notable peaks are Belknap, Delano, Baldy and Barrette, all above 12,000 feet. Nestling in little pockets along the range are many beautiful little lakes, the most notable of which is Puffer's Lake in the vicinity of Mt. Baldy. The entire section is ideal for vacationists who want to get away from the beaten path and can stand a little roughing, for the highways, other than those connecting the principal towns, are little more than trails, and the way to the most pleasing retreats and the most majestic scenery is little more than a dimly outlined path.

Piute County is considerably smaller than its neighbors. The country generally is broken and about the only agricultural possibilities are found along the rather narrow valley of the upper Sevier River, along Otter Creek and in Grass Valley. The mountains are covered with good timber, about one-half of the county's area being included in the Powell, Fish Lake, Fillmore and Sevier National Forests. These conditions are ideal for stock raising and, de-

spite the mineral resources, stock growing is the principal industry.

In the vicinity of Marysvale the Sevier Valley is very narrow, but it widens to the south in the vicinity of Junction, the county seat. Between Marysvale and Junction is situated the Piute reservoir which stores water for thousands of acres of fertile lands in Sevier County. The valley widens again to the south of Junction and there has been established the settlements of Circleville and Kingston.

Although not the seat of county government, Marysvale is the most important town in the county, especially from a commercial viewpoint. It is there that the railroad ends—a branch line of the Denver & Rio Grande railroad from Thistle—and Marysvale is the shipping point for practically all that big country from there to the Arizona-Utah state line, a distance of more than 200 miles. Vast coal and timber resources exist in the country to the south and preliminary surveys have been made for branch railroads to tap the section when conditions may justify.

RICH COUNTY

Green-clad mountains, fertile valleys traversed by gurgling mountain streams, a fresh-water lake of wonderful beauty and generous proportions, and an invigorating climate combine to make Rich County an ideal refuge from the turmoil of the business world and a mecca for those who appreciate the beauties of nature in the rough with modern conveniences nearby.

Situated in the northeastern corner of the Utah panhandle, rich in resources but rather small in area, Rich County has been permitted to work out its transportation problems as best it could, with the result that it is without a railroad except along its southeastern corner, and the development of the country generally has suffered. Gradual improvement in the highways since the advent of the motor vehicle has done something toward the solution of the transportation problem and has made accessible to the vacationist the restful retreats of the region. Only a few hours' ride from Logan through a canyon of rare scenic beauty and scarcely more than half a day's journey from Ogden and Salt Lake City by motor, Rich County is destined to become one of the great summer playgrounds of the urban population of Utah.

The principal attraction for the vacationist is Bear Lake, a beautiful body of fresh water twenty-two miles long and eight miles wide, nestling between the mountain ranges and about evenly divided between Utah and Idaho. Rustic summer homes, tent colonies and pretty little cities peep from among the trees which dot its shores; trim rowboats and lean motor launches race across its surface, and bathers gambol in the shallow waters along white and sandy beaches from June to September. Fish there are in abundance and the anglers make the most of their opportunity. Around its shores are grouped the picturesque and thriving towns of Garden City and Laketown, in Utah, and Fishaven, St. Charles and Turnpike, in Idaho. For, although the city dwellers to the south have begun to appreciate Bear Lake as a summer resort only within recent years, citizens of southern Idaho towns have been making their annual pilgrimage for a decade or longer.

But Rich County's resources are not confined to its vacation resorts. The very agency, or lack of it,—rail transportation—that has prevented development along many lines, supplemented by ideal range conditions, has made Rich County one of the leading livestock sections of the

State. The luxuriant grasses covering the mountains furnish unexcelled grazing during the summer months and the fertile valleys produce ample hay for winter feeding. Some years ago Rich County farmers began to appreciate the high-grade stock, and pure-blood animals now are nearer the rule than the exception.

Rich County apples are among the most delicious in the State, and other small fruits and berries of unusual flavor are raised in abundance to care for the local needs. But because of the livestock industry, agricultural efforts are devoted largely to hay and grain. The soil is deep and exceedingly fertile and the valleys are well watered by mountain streams. On the mesas the average annual precipitation is about fifteen inches, making conditions highly favorable to dry-farming which is practiced with success. Thirty bushels of wheat, fifty bushels of barley, sixty to seventy bushels of oats or three tons of hay to the acre are not unusual yields.

In the Crawford Mountains is one of the great phosphate areas of the United States. There are outcroppings of phosphate strata aggregating 113,000 feet, and the United State Geological Survey estimates there are in the deposit 90,000,000 tons of available phosphate rock carrying seventy per cent or better of bone phosphate. Smaller deposits occur in other parts of the county but investigations made have not been sufficient to justify an estimate of the tonnage. Some development work has been done in the Crawford Mountains and several thousand tons of phosphate rock have been mined and hauled by wagon to the railroad at Sage, Wyoming. However, this method of handling the product proved too expensive to justify undertaking development on a big scale and there is no activity in the field at this time. To the north in Idaho, near Paris, a big property has been opened up recently and an extension of the railroad built to permit the shipment of vast quantities of the rock to Pacific coast points.

Along the western border of the county is a range of mountains which is heavily mineralized. Many small deposits of unusually rich ore have been found, carrying principally silver, lead and copper. Prospecting has been confined chiefly to persons living in the vicinity who are without experience and practically nothing has been done in the way of development.

Besides the towns in the vicinity of Bear Lake, there are Randolph, the county seat, situated near the center of the county, and Woodruff, in the eastern part of the county, both prosperous farming and stock growing communities.

A road building program has been undertaken, which, when completed will connect all the principal towns of the county and give them good highways to the cities and towns in neighboring counties.

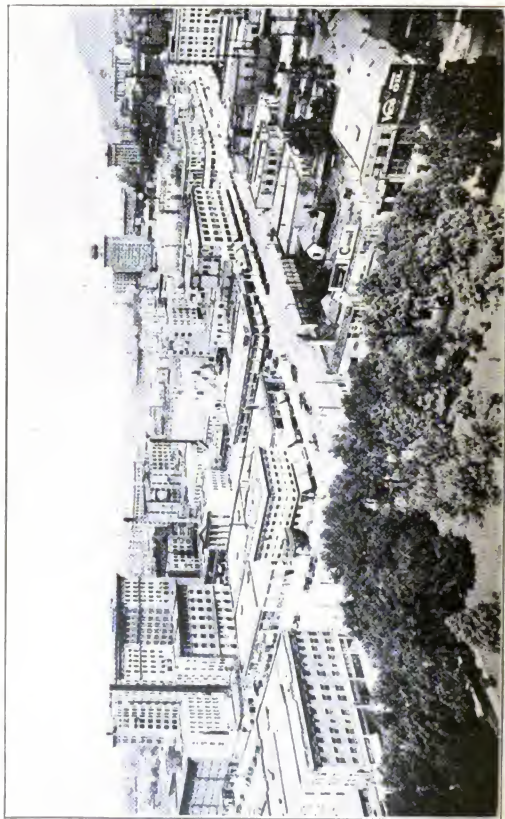
SALT LAKE COUNTY

"Salt Lake City—an institution; not a curiosity."

Allen D. Albert's terse description of the intermountain metropolis certainly is expressive but to some it may not be convincing. Thousands of tourists visit the city annually as a curiosity. If they are observing they learn that it is an institution, but most of them prefer to cling to the opinion that they have seen a curiosity as well. And Salt Lake citizens are not inclined to argue the question. They welcome the curiosity seekers as well as home seekers as quite frequently the curiosity seekers eventually become home seekers. Any way, they like to make new acquaintances. It supplies the most effective channel for the dissemination of correct information concerning conditions, resources and opportunities, not only those afforded by the city but by the State and the Intermountain region as a whole.

Salt Lake City is the business and manufacturing center of the great Intermountain region. It is the largest city between Denver and the Pacific coast cities, barring Spokane. Commercially it is one of the most important inland cities in the great West. It is the distributing point for Utah, western Colorado, eastern Nevada, southern Idaho, western Wyoming and parts of Montana and Arizona. It is headquarters for most intermountain branches of outside business institutions as well as the majority of the bigger business institutions of the Intermountain region. It is served by transcontinental railroads radiating in all directions as well as local interurban lines. It is a thrifty, healthy youngster, scarcely more than in its infancy. It is one of the most modern cities on the continent and its progress is continuous. Its population in 1910 was 92,777; in 1920 it is in excess of 118,000—an increase of 28 per cent; no boom, just a natural healthy growth, stimulated by the development of the state and the Intermountain region. And the development of the State and the Intermountain region has only begun. Their illimitable resources have scarcely been scratched. The opportunities that have been grasped are only a drop in the bucket as compared with the opportunities of the future.

Naturally, Salt Lake City is the financial center of the region it serves. The bank clearings this year should approach and possibly exceed a billion dollars. New development is fostered and encouraged to the extent of the capital



BUSINESS SECTION OF SALT LAKE CITY
From the City and County Building



LOOKING NORTHWARD ON MAIN STREET
Salt Lake City — State Capitol in Right Background

available. But the resources are so great that rapid development can come only with the aid of outside capital.

There is a firmly established opinion abroad that Salt Lake is strictly a Mormon city. True, it was founded by those hardy pioneers of Mormon faith, and they and their descendants have taken a large part in its building. But, strange as it may seem, the population of Salt Lake City is approximately 60 per cent non-Mormon. Almost every sect known to the North American continent is represented in Salt Lake City by one or more churches, and all work harmoniously toward the building of a greater city and a greater State.

The public school system of Salt Lake ranks near the top among the schools of the larger cities of the country. There are schools also that are supported by various religious sects. The climax in educational institutions in both City and State is the University of Utah, situated in the eastern part of the city.

Most of all, Salt Lake is a city of homes. Its percentage of home-owners is unusually high and the homes are substantial as well as of artistic design. The transient population is small but ample provisions have been made for those desiring only temporary homes. Apartment houses are steadily increasing in number and among the hotels are some of the finest west of the Missouri River. As a convention city it has a reputation equalled by few and excelled by none.

The climate of Salt Lake is ideal for those who are old-fashioned enough to want four seasons each year. Salt Lake has four seasons, each distinct but none extreme. The altitude, too, is a happy medium—approximately 4,200 feet above sea level. In the warmer days of summer, the nearby canyons afford cool and pleasant retreats and are accessible over good highways by motor trips of anywhere from fifteen minutes to two hours. Half a dozen or more of the nearer canyons are dotted with summer homes of the city dwellers. And while the winters in the city are mild, the nearby mountains afford excellent fields for all kinds of winter sports. And, in passing, one of the most effective antidotes for summer warmth is a dip in the briny waters of Great Salt Lake, thirty minutes' ride by motor or inter-urban from the heart of the city.

But Salt Lake City and Salt Lake County, although closely allied, are separate entities. Their interests are much in common but each maintains its governmental organization. The city has approximately eighty per cent of the entire population of the county but occupies less than

three per cent of the territory. Along the main highways, however, the towns are so closely situated that it is extremely difficult at times to determine where one town ends and another begins.

There are few more fertile spots in the country than Salt Lake County, especially that portion of it situated in the Great Salt Lake valley. Practically all crops common



BATHING IN GREAT SALT LAKE

Salt Lake County.

to the north temperate zone, north of the cotton line, are grown successfully and yield heavy returns. Eighty-nine per cent of the crop acreages of the county were under irrigation this season. There are some bench lands that are not susceptible to irrigation under existing systems and there are many thousands of acres of land between Salt Lake City and Great Salt Lake awaiting drainage to become among the most fertile and productive in the West.

Intensive farming is the rule in Salt Lake County. Truck gardens, orchards and sugar beets assure the highest yields. Grain and hay are grown as rotation crops and as a valuable adjunct to the dairy industry which yields handsome returns. Land values are too high to permit the cultivation of the usual farm crops to any extent. As a rule the tillable lands are cut into small tracts and cultivated by the owners.

The county shares with the city the honors of a manufacturing center. There are upwards of a thousand manufacturing establishments of various kinds in the State and

approximately 60 per cent of them are situated in Salt Lake City and Salt Lake County.

On the eastern side of the county are the Wasatch mountains and on the western are the Oquirrh, each a treasurehouse of metals. In the Wasatch mountains the principal camp in the county is Alta, and in the Oquirrh is the famous camp of Bingham. And down in the valley between the two ranges are the smelters and other reducing plants incidental to the mining industry. Each of the camps



TYPICAL HARDSURFACED HIGHWAY
Salt Lake County.

has been a consistent producer since pioneer days, but in the past twenty years Bingham has outdistanced its neighbor across the valley. Among the famous mines at Bingham now in operation are the Utah-Apex, the Utah Consolidated and the Utah Copper, the latter being one of the big copper producers of the world today. It is a big open-air mine, where, under normal conditions more than a score of steam shovels work twenty-four hours a day, gradually tearing down a mountain and moving almost as large a daily tonnage as was moved in the construction of the Panama Canal. It is a mountain of low-grade copper ore, connected with the

company's two big mills by a private railroad constructed at a fabulous cost. Some idea of the immensity of the proposition and what it means to the County and the State is reflected in its banner year's operation when copper was in demand during the war, when the production amounted to about \$75,000,000 and \$24,000,000 were paid in dividends.

The principal smelting plants in the county are situated at Murray and Midvale, south of Salt Lake City, and at Garfield, west of Salt Lake City and north of Bingham, and near the Arthur and Magna mills of the Utah Copper Company. On the bench between Bingham and Garfield is situated the Utah plant of the Hercules Powder Company.

In the north end of the county is the center of the packing industry. There are the Salt Lake Union Stock Yards and the plants of the Cudahy and the Utah Packing & Provision Company, which have gone a long way toward making Salt Lake City and County the center of the packing industry in the Intermountain region. There are other packing plants of lesser importance in other parts of the county, especially that of the Murray Livestock Company, south of Salt Lake.

Salt Lake City and County invite the vacationists, the curiosity seekers and the home seekers to avail themselves of the magnificent opportunities awaiting in all three fields.

SAN JUAN COUNTY

With an area of only a couple of hundred square miles less than the state of Massachusetts, San Juan County has a population equalled by many New England villages. Within its borders are more than 8,000 square miles of territory and its gross population, including Indians, is not much in excess of 4,000, or about half a person to the square mile. It is a goodly share of the last frontier in the United States—a country where the cowpuncher, the Indian, the prospector and the log cabin of the homesteader are genuine parts of the scenery and not incongruities. It is a land of unparalleled natural scenery, a country of magnificent distances and big opportunities, a region with a most fascinating history. It is the home of the purple sage.

Situated in the southeastern corner of the State, San Juan is the most isolated of all the counties from rail transportation, but this very isolation causes the most to be made of one of its greatest resources—the greatest livestock range left in the West. The country is broken and in some places extremely rough, but, withal, exceptionally adapted to grazing purposes. Of the 5,100,000 acres in the county, less than 500,000 are in private ownership, according to the assessment rolls. About 450,000 acres are within the La Sal National Forest; another 500,000 acres are within the Navajo Indian Reservation; some 200,000 acres have been withdrawn by the Federal Government as oil lands but are now subject to lease. The State school sections account for another half million acres and still there are left subject to homestead and desert land entry some 3,000,000 acres, or about 60 per cent of the county's area.

The late Professor L. A. Merrill, after a wide experience as head of the Extension Division of the Utah Agricultural College, declared San Juan County not only the best dry-farming county in the State but best in the West. Subsequent developments have done much to vindicate his judgment. With an average precipitation in most of the dry-farming districts of 15 to 20 inches annually and soil conditions unusually favorable, San Juan has been inclined to encourage the application of this method of farm development rather than expensive irrigation projects. Wheat is the principal dry-farm crop, although oats and barley respond to this method of cultivation. The dry-farm wheat is superior to most grown by irrigation and the yield of 35 to 40 bushels to the acre under favorable conditions is nearer the rule than the exception.

In the Colorado, San Juan and other rivers there is ample water to reclaim all the arid lands of the section were it not that the expense of building the projects would be prohibitive. However, there are several small irrigation projects in operation with highly gratifying results, the mushroom growth of the town of Grayson being responsible to this character of development. General conditions are favorable to the growing of a wider variety of crops in San Juan than in the central and northern portions of the State but inasmuch as everything grown must find a home market or move on its own feet, there has been little call for diversified farming.

With all its agricultural possibilities, San Juan is not a farming section primarily. Its principal industry is stock growing. Interest is pretty evenly divided between cattle and sheep but horses are not entirely out of style.

San Juan's chief claim to fame at this particular time, however, is its remarkable natural bridges. About a dozen have been discovered up to this time and about half of them would make from two to four of the famous Virginia natural bridge, so long considered one of the wonders of the new world. Three of the bridges—the Edwin, the Carolyn and the Augusta—are situated in the White Canyon region almost west of Grayson and are included in the National Bridges National Monument. The greatest natural arch yet discovered is the Nonnezoshe, northwest of Navajo Mountain and near the Colorado River, and now included in the Rainbow Bridge National Monument. It is 308 feet high and has a span of 275 feet. The Sansosie, in Monument Park, near the Utah-Arizona line, has been discovered more recently and has not been included in any government withdrawal as yet. It is 350 feet high but has a span of only about 75 feet.

Numerous efforts have been made within recent years to build a motor highway through the natural bridge region and connect them with Mesa Verde National Park on the east, and Grand Canyon and Zion National Parks on the west. Much of the San Juan country, however, is unexplored and the population of the county is so small that if any extended road program is undertaken the financing must be done on the outside. The State, in connection with the county, however, has undertaken the improvement of the main highway between the principal towns of the county and the railroad at Thompsons on the Denver & Rio Grande. While the bridges are decidedly unusual and interesting, there are many other natural wonders in the region. Some of the most remarkable formations in the

west are to be found in the Monument Valley country, which, in many ways bears resemblance to the Painted Desert district. Also, there is the Colorado River and its wonderful gorges leading to the Grand Canyon and scores of side canyons, many of which are yet unexplored. Then, too, there are historical curiosities of deep interest in the form of ruined habitations of the Cliff Dwellers. Some of the most famous of these ruins are Kitsil, Betatakin and Bat Woman House, but new discoveries are being made by the archaeologists each year.

In these days of motor driven vehicles, a report of an oil discovery commands attention throughout the country, and if the discovery appears of any magnitude the interest extends far beyond our national borders. San Juan had its thrills from oil discoveries more than a decade ago. It was demonstrated conclusively that there was oil in the county but in those days oil wasn't worth a great deal. Then there was the question of transporting materials and machinery into the field and getting the oil to market and the shortage of experienced labor. To further dampen enthusiasm, the Government withdrew all public lands in the district from entry. The enactment of the leasing law in February, 1920, makes it possible for private interests to develop the field and the steadily increasing demand for oil makes it important that they do so.

The field lies in the valley of the San Juan River west of Bluff and the oil obtained is high in gasoline and kerosene, testing usually from 35 to 40 Baume. Although oil seeps were observed along the San Juan River by freighters and traders in the early '80s and the first claim was filed upon by E. L. Goodridge in 1882, no drilling was done until the fall of 1907, and on March 4, 1908, San Juan celebrated the inauguration of William Howard Taft by bringing in a "gusher" which threw oil 70 feet into the air. The excitement that followed brought drilling rigs from all parts of the country and during the winter of 1910-11 it was reported that 27 rigs were being operated and others were on the way. Transportation, lack of markets, labor shortage and land withdrawals gradually overcame the enthusiasm but not until many wells had been brought in and title established to some of the land. That the possibilities were equally favorable for oil in other parts of the county than where the discoveries were made, was the opinion expressed by E. G. Woodruff of the United States Geological Survey after an investigation of the region in the summer of 1910. Since the enactment of the leasing law interest has again

been awakened in the San Juan country and within another year some highly important developments are expected.

Where there is room for the explorer it is only natural and proper that the prospector will be found. In the river sands are fine grains of gold but on the whole the metal is too scarce or the grains too fine to encourage extensive operations. In recent years, however, the prospector has brought in something almost as precious as gold. It is carnotite ore, from which we obtain radium and vanadium, and ordinarily it ranges in value from \$80 to \$160 a ton. Northern San Juan County is a part of the greatest known carnotite field in the world.

In the northern part of the county, too, there is another unusual metal deposit—a veritable sandstone mountain impregnated with copper. The property is known as the Big Indian and a company bearing that name was organized several years ago to work the deposit. A large sum has been expended in development of a process for treating the ore and in the erection of a mill, and it is expected that blister copper will be moving to market before the end of the year.

San Juan is the biggest of our counties and it offers big opportunities to the man who is willing to follow the precepts laid down by that hardy breed of men and women who built the rest of the West—the pioneers. And it is not all wilderness—there are towns such as Monticello, the county seat; Blanding, Grayson, Verdure and Bluff.

SANPETE COUNTY

Geographically Sanpete County just about occupies the center of Utah. Its fertile valleys are among the banner farming regions of the State. The farms of Sanpete and its neighbor on the south, Sevier County, rival in fertility and productiveness those of the famed Cache and Bear River Valleys and Cache and Box Elder Counties in the northern part of the State. Generally, the products of the two sections are very much alike.

Sanpete County embraces an area of 1,013,760 acres, including the Sanpitch valley, through which the river of that name flows on its way to join the Sevier. The valley is Y-shaped, with the stem to the south and the prongs to the north. In the west fork of the Y are the towns of Fountain Green, Freedom, Moroni and Wales, while in the east fork are the towns of Milburn, Fairview, Mt. Pleasant and Spring City. Near the junction of the forks are Chester, and southward are Ephraim, Manti, Sterling, Mayfield and Gunnison. The Sevier valley also reaches into the southern part of the county and in it are the towns of Centerfield and Axtell. The northernmost town in the county is Indianola, which is over the summit in the Spanish Fork drainage. East and West of the valley are great mountain ranges which afford excellent summer grazing and from which come numerous mountain streams to supply water for irrigation in the valley.

As has been intimated, agriculture is the chief industry of the county. According to the 1920 census there are approximately 2,000 farms in the county. Under the 1919 assessment classification there were 175,199 acres listed as farming lands with a valuation of \$3,951,623 and 139,649 acres as grazing lands with a value of \$609,305. The total assessed valuation of the county was \$14,092,550. The assessment rolls showed 22,930 head of cattle in the county, valued at \$970,985; 46,685 sheep, valued at \$460,890; 3,243 swine, valued at \$29,590, and 5,977 horses, valued at \$408,790.

Hay and grain are the principal crops of the county, although excellent garden vegetables and fruits are raised for local use. Sugar beets also form an important crop, especially since the erection of beet sugar factories at Moroni and Gunnison or Centerfield. Prior to the establishment of local sugar factories the farmers of Sanpete county raised large acreages of beets and shipped them to the factories of Sevier and Utah Counties. During the 1920

season there were 9,400 acres planted to winter wheat, 15,000 acres to spring wheat, 6,600 acres to oats, 1,800 acres to barley, and 26,800 acres to alfalfa. The estimated yield was 175,000 bushels of winter wheat, 330,000 bushels of spring wheat, 283,800 bushels of oats, 63,000 bushels of barley and 110,000 tons of alfalfa. Potatoes form another staple crop and recently considerable attention has been given to the growing of peas for canning purposes. The Sanpete Valley furnishes an excellent field for the canning industry. The first canning plant in the section was erected at Ephraim in 1913 and the results of the experiment have been very gratifying. Moroni, Fountain Green, Mt. Pleasant and the Gunnison Valley are the principal sugar beet sections. Alfalfa seed is grown in various parts of the county but probably is given more attention in the Gunnison valley than elsewhere.

Two branch lines of the Denver & Rio Grange supply rail transportation for the county. The Marysvale branch traverses the county north and south and another branch between Manti and Nephi, the latter in Juab County, affords another outlet. In addition to the railroad facilities, the county is well supplied with good highways which not only connect the principal towns but connect the county with the cities of Utah, Salt Lake and Weber Counties on the north, and of Piute, Sevier, Garfield, Wayne and Kane Counties on the south. Besides the markets of the cities of the more populous sections, Sanpete farmers find a ready demand for much of their produce, especially poultry, in the mining camps of Carbon and Emery Counties.

For many years the farmers of the county were dependent on irrigation, or believed themselves to be, but the advent of dry-farming has been responsible for the cultivation of vast areas of fertile bench lands. This is especially true in the regions near Indianola, and on the benches near Freedom and Wales and west of Manti. For many years the country north and west of Fountain Green was considered too dry and gravelly to be of any use except for grazing. About ten years ago it was put on the market by the State and bought by farmers of the section for experimental dry-farming. It has proven to be excellent dry-farm wheat land and has encouraged dry-farming in various other parts of the county.

Luscious native grasses, excellent hay and highly favorable natural conditions have stimulated the dairy industry. The section is ideal for dairying, rivaling Cache County, and creameries have been established at Manti, Ephraim, Mt. Pleasant, Fairview, Gunnison and other points in the

valley. Many farmers operate their own separators and ship the cream direct to market. Other branches of the livestock industry figure extensively in the activities of the Sanpete County farmers. For many years sheep growing predominated but more recently attention has been turned more and more to cattle growing. The sheep and cattle are grazed during the summer months on the forest reserves, which occupy a considerable part of the county's area, and on privately owned grazing lands. In the winter some of the sheep and all the cattle are fed in the valley but large flocks of sheep also are wintered on the deserts in the western part of the State. Fountain Green, Mt. Pleasant and Manti are the principal wool shipping points, but considerable wool also is produced in the vicinity of Fairview, Spring City, Wales, Ephraim and Gunnison. Some of the finest pure-blood stock in the western country is found in the county, especially in the vicinity of Mt. Pleasant, where some of the most progressive farmers and stock growers have specialized in pure-bred animals.

Some of the finest building stone in America occurs in great quantities near Manti and Ephraim. It is an oolitic limestone, very similar to the famous Caen stone, a beautiful white color and easily worked and hardened after exposure to the air. The stone was used in the construction of the Mormon Temple at Manti and for interior walls of the State Capitol at Salt Lake City. Large quantities of the stone have been shipped to various points on the Pacific coast and in the eastern part of the United States, notably for the interior of the mansion of the late E. H. Harriman in New York. Two well equipped quarries are operated near Ephraim.

There are no large cities in the county but there is a group of towns, all progressive and nearly all modern in the way of improvements, varying in population from 800 to three or four thousand. Most of the towns have electric light plants, water systems (some municipally owned), cement sidewalks, modern schools, churches and public libraries. The growth of none of the towns has been rapid or spectacular, but more along substantial and conservative lines.

While most of the irrigation is accomplished by direct diversion of water from the streams, there are some important reservoir projects. The Wales reservoir, between Wales and Moroni; the Gunnison reservoir, near Gunnison, and the Nine Mile reservoir, near Sterling, are examples. In the Gunnison reservoir is stored the high waters of the Sanpitch River. The Piute project, which embraces the

storage of surplus waters of the Sevier river at a point near Junction, in Piute County, and covers a considerable part of the reclamation of the lands in the Sevier Valley, Sevier County, also extends a short distance into southern Sanpete County.

There are no big tracts of public lands open in Sanpete County. Practically all the big tracts of Government land left in the county are in the forest reserves. There are, however, large acreages of good farming lands which are being divided from year to year as farming is practiced on a more intensive scale, and these lands are available at reasonable figures. There is a need for more intensive farming, and to accomplish that end Sanpete County needs more settlers.

SEVIER COUNTY

Given soil which is unexcelled and ample water for all purposes, Sevier County is one of the banner agricultural sections of the State and the western country. The soils in most parts of the county are of clay and sandy loam, particularly adapted to the growing of alfalfa and small grains but highly favorable to all kinds of agricultural pursuits.

Sevier County has an area of 2,068 square miles—1,323,520 acres—approximately two-thirds of which are included in the Fish Lake and Fillmore National Forests. The agricultural area is confined largely to the broad valley of the Sevier River, from which the county derives its name, and which occupies the major portion of the area outside the forest reserves. Water is available for practically the entire valley and nearly all of it is under irrigation. On the east and west sides of the valley, along the mountain foothills, fruit growing is a profitable industry.

Water for irrigation is obtained chiefly from the natural flow of the Sevier River, together with several reservoirs which have been built in the mountains. The biggest project is the Piute, built by the State Land Board. The reservoir is situated in Piute County near the town of Junction and has storage capacity for approximately 90,000 acre feet of water. Recently the project was sold by the State to the landowners under it at about \$1,500,000. Outside of the Sevier valley there are a number of large basins of extremely fertile land that have been yielding big returns to the dry-farmers. On the whole, the farming lands are pretty well taken up, but as a rule the holdings are large and could be segregated into smaller tracts if there were sufficient settlers to undertake farming on a more intensive scale. Approximately 80 per cent of the agricultural lands in the county are under cultivation. Estimates of the United States Department of Agriculture indicate that poor plow lands in the county, of which there are few, were valued at \$109 an acre as compared with a general average of \$60 in the State as a whole. Good plow lands were valued at \$258 an acre, while the general average value of lands of this character throughout the State was \$135 an acre. The average price of all plow lands in the county was \$200 an acre as compared with a general average of \$103.

During the season of 1920 there were 600 acres planted to winter wheat, 3,300 acres to spring wheat, 2,600 acres to oats, 400 acres to barley and 23,200 acres to alfalfa. The

estimated yield of each was 12,000 bushels of winter wheat, 72,000 bushels of spring wheat, 112,000 bushels of oats, 14,000 bushels of barley and 95,000 tons of alfalfa.

The total assessed valuation of property in the county for 1919 was \$11,113,980. The assessment rolls showed 174,840 acres in private ownership, of which 68,813 acres were classified as farming lands with a value of \$3,847,918, and 92,411 acres as grazing lands with a value of \$433,436. The livestock assessment showed 31,311 head of cattle valued at \$1,365,676; 56,755 head of sheep valued at \$608,099; 3,455 swine valued at \$32,756, and 4,962 horses valued at \$366,350.

As reflected in the assessment, stock growing is an important industry and has been stimulated considerably by the beet sugar industry and the adaptability of Sevier County lands to alfalfa. The Sevier is one of the finest sugar beet sections in the State and furnishes an ample supply of beets for the factory near Elsinore. Since the erection of the factory, thousands of head of cattle have been wintered annually in Sevier County. The beet tops are utilized extensively for fattening hogs, thereby eliminating to a considerable extent the use of grain. The farmers get three good crops of alfalfa and enough of a fourth crop to afford excellent pasture. The alfalfa usually finds a ready market among the stock growers who use it for winter feeding.

There are a number of modern and progressive towns in the county, the principal one being Richfield, the county seat and the metropolis of south-central Utah. It is one of the most progressive cities in the State. It has every modern convenience, paved streets, sidewalks, a lighting system which is the envy of many cities of several times the size of Richfield and an excellent drainage system. The city has expended during the past two years \$325,000 in the construction of sidewalks and paved streets. Its schools are fully in keeping with other modern and progressive features of the city. Among other towns of note are Salina, Monroe, Elsinore, Joseph, Annabelle, Central, Sigurd, Redmond, Aurora, Koosharem and Burrville. The biggest development is taking place in the towns along the main north and south highway, especially at Richfield, which is an important point on the Salt Lake-Bryce-Grand Canyon Highway and the gateway to the famous Fish Lake resort. Fish Lake is a beautiful body of water situated in the mountains about fifty miles southeast of Richfield and is one of the finest fishing resorts in the West. A new road from the main highway to the resort is now practically completed,

which will make the region more easily accessible and make the country much more popular with vacationists and sportsmen.

Dairying also is proving a money-making industry for the farmers of the county. Some local creameries have been established and some dairy products find their way to the Salt Lake City market, but there is a great deal of room for development in this respect. Some efforts have been made to bring about the establishment of a milk condensory in the Sevier Valley which appears to offer a splendid opportunity for such an institution. Poultry raising is growing in popularity, especially in relation to turkeys.

Sevier County has made no great claim for recognition on account of its mineral resources but nevertheless some of the State's big coal beds are found within its boundaries. The coal fields of Sevier are an extension or continuation of the Carbon-Emery County fields are situated in the northeastern section. They probably are more accessible from Salina than any of the other important towns and a branch railroad was built many years ago up Salina Canyon to develop the deposits. At that time there was not a wide market for coal in this part of the country and other difficulties arose which resulted in the suspension of operations. The coal market has developed wonderfully in recent years and surveys have been made for the construction of a railroad from the vicinity of Price, in Carbon County, through Carbon and Emery Counties and into the Sevier Coal fields. As yet, however, no construction work has been undertaken and no definite plan for the building of the extension has been announced.

Gypsum is one of the minerals which is being developed in the county but no ways near its possibilities. One of the finest and biggest gypsum deposits opened up in the State is being worked by the Jumbo Plaster Company at Sigurd. The gypsum tests better than 99 per cent pure and the supply is of such magnitude that it might be termed practically inexhaustible. The products of the mills are marketed throughout the Intermountain and Pacific coast regions and in sufficient quantity to keep the quarries and mills working the year round. The company also produces a land plaster which is shipped extensively to California and northwestern points.

Rock salt is mined in open cuts near Salina.

There are but two metal mining districts in the county—the Henry district, five miles south of Sevier, and Salina Creek, near Salina. The production has been small and reports at present indicate there are no producing properties.

There are many opportunities for development in the county but its chief attraction is that it is a well settled, well improved and well watered country, especially adapted to intensive farming. It should appeal to the home seeker who desires to take up his abode in a prosperous and well developed section where the opportunities are greatest for some building along the line well established in the central and middle western states.

SUMMIT COUNTY

There is a lure in the thought of taking precious metals from the ground—wealth overnight—that few can resist. It is this fascination that has drawn men and women from various parts of the world to Summit County. Since the discovery of rich silver-lead ore in the old Ontario mine at Park City in the early '70s, Summit County has been recognized as one of the great silver regions of western America. Nearly two hundred millions of dollars have been wrested from Mother Earth in the Park City district and each year sees a material addition to the production record of this wonderful camp. The old Ontario, whose discovery started the mining boom in the region, still contributes daily its share toward the maintenance of the record of the camp, as do others of ancient date—such as the Silver King Coalition, the Judge, the Daly and the Daly-West—and scarcely a year goes by that a new bonanza is not recorded. And yet, probably not more than half the mineralized area of the district has been explored.

Summit County has within its borders 1,232,192 acres of land, practically all of which is in the heart of the mountains. The area that has produced fabulous wealth from mineral development is small and is situated in the southwestern corner of the county, about thirty miles from Salt Lake City. On the whole the topography of the county is rough—mountains covered with majestic forests interrupted frequently by green and wonderfully fertile valleys. The forests are practically untouched as are many of the mineral resources outside the Park City district, and the valleys are being cultivated only to a limited extent.

Included in the mineral resources to be developed are extensive deposits of bituminous coal in the vicinity of Coalville, phosphate along both flanks of the Uintah Mountains and hematite iron east of Park City. At Coalville some work has been done toward opening up the coal field but the output is chiefly for local consumption except in the case of the Weber Coal Company. Nothing has been done on the phosphate deposits, the investigations as to the extent being only of a limited character. Many years ago the hematite iron deposit was worked to obtain iron for flux at the Park City smelters. The ore was mined under adverse conditions and was hauled to Park City in wagons. Operations at the property have been suspended for many years but there is a ready market for a considerable output

of hematite iron at the Salt Lake Valley smelters if rail transportation were available.

While attention has been focused chiefly on mining operations in Summit County, stock growing has been given considerable attention because of the excellent range. Forest reserves generally are among the choicest grazing sections of the West and almost half the county is included in the Uintah and Ashley National Forests. Wild grasses grow in profusion on the mountainsides not covered by the forests and in the valleys and furnish not only the finest grazing but provide excellent hay for winter feeding.

Generally, the valleys are well watered by mountain streams and irrigation is practiced by individual farm owners. So far there has been no co-operative effort of any proportions to reclaim big areas and usually the valleys are so small that efforts in this direction on a big scale would not be justified. The altitude is such that the country is best adapted to the growing of grains and grasses, and, furthermore, there is a ready market for these products. Potatoes and other root crops also yield good returns and many of the valleys should produce a superior grade of peas for canning purposes. The soil is a clay loam, varying in depth from ten to seventy feet and with no hard pan. The elevation in the valleys varies from 5,300 feet at Henefer to 6,335 at Pine View and 6,500 at Kamas and Snyderville. There are 615,265 acres of privately owned grazing land and about 35,000 acres of tillable land, of which 80 per cent is under cultivation. The tillable area includes the land along the Weber River and its tributaries, the Kamas and Parley's Park Valleys. The Bear, Green, Provo and Weber Rivers rise in the mountains in the county. The streams and mountains abound in fish and game, and Holiday Park, at the head of the Weber River, is a rendezvous for summer campers from Salt Lake City, Ogden, Provo and other Cities of the State.

Summit County is a natural dairy country, the conditions there rivalling Wisconsin in this respect. Besides the mining camp of Park City, Salt Lake City and Ogden furnish nearby markets for all the sweet milk and cream that can be produced. In the upper Weber Valley, where the distance to market is a little longer, the cream is separated on the farm and sent to butter plants, one of which is at Hoytsville and another at Oakley. Many pounds of butter are made on the ranches. In the fall of 1919 an up-to-date cheese factory was opened at Kamas, in the heart of the Rhodes Valley, by the Mutual Creamery Company, and another plant is planned to be erected by the same company

next spring at Wanship. Parley's Park, Kamas and Weber Valleys offer splendid fields for milk condensories.

The high quality of Summit County beef is known throughout the West. Mountain pastures are good for about five and a half months out of the year, ranch pastures for about two months in the fall, and the hay raised is sufficient to feed the remainder of the year. The Herford breed has forced itself into prominence in recent years but in Parley's Park and the Kamas Valley and Echo Canyon the Southern predominates.

The range also is excellent for sheep. Large flocks are grazed each summer on the Summit County range and small flocks on the farms prove very profitable. Hog raising also is developing into a profitable business. Park City offers a good market for dressed pork and Salt Lake and Ogden markets readily absorb hogs on foot.

The county has within its confines 50 miles of the Lincoln Highway, that part of it between Park City and Salt Lake City being a real boulevard. The larger towns of the county also are served by branch lines of the Union Pacific and the Denver & Rio Grande railroads. Among the more important towns besides Park City and Coalville, the county seat, are Kamas, Wanship, Peoa, Hoytsville, Oakley, Snyderville and Henefer.

There are flattering opportunities in Summit County in the various producing industries but at this time the professional field and the ordinary business field are pretty well covered. There are thousands of acres of mineral lands to be developed, farm lands to be put under cultivation and the dairy industry is in its infancy. In the eastern and southwestern parts of the county are great stands of timber, some of which is being utilized to a very limited extent now. To bring about the development of this great resource, however, more railroad lines are needed. The timber is largely of the fir family but there are occasional groves of white and yellow pine of good quality, and some Norway pine and balsam. It is estimated that fully 80 per cent of the timber is suitable for building purposes. The Forestry Department estimates that there are more than three billion feet of saw timber in these forests. The development of this resource will mean not only the establishment of a new and valuable industry in the State but it will also keep hundreds of thousands of dollars home each year that now go to lumber regions of other states.

Up in the timbered region also are some of the highest peaks in the State. Among them are Gilbert Peak, 13,687 feet high; Tokewana, 13,450; La Motte, 12,892; Hayden,

12,500 ; and Bald Mountain, Hoyt's Peak, Mount Watson and Reed's Peak, all above 11,000 feet in elevation. In the Uintah range, especially, there are hundreds of beautiful little mountain lakes which are the source of numerous mountain streams and all abound in trout. The region as a whole is one of the best fishing and hunting sections and potential vacation resorts on the western slope of the Rockies. The lakes furnish wonderful sites for camping and for summer homes but development along these lines will be deferred until highways are built to make them accessible. It is understood that the United States Forestry Service is outlining a program of road construction in this section and that the work probably will be begun in the year 1921.

TOOELE COUNTY

In 1855 Lieutenant E. J. Steptoe laid out a military reservation to include Rush Lake and the luxuriant meadow pasturage to the post at Camp Floyd. Then came General Patrick Connor and his volunteers from California to relieve Colonel Steptoe in 1862 and they pitched their tents on the shores of Rush Lake. Those Californians knew something about gold mining and when guarding the stock on the range around the lake they undertook a little prospect work in the nearby hills. A piece broken from a promising ledge assayed rich in silver. A mining district was organized and the town of Stockton was surveyed and organized in March, 1864, and made a military post known as Camp Relief. The ores in the Ophir district were discovered the following year. Treasure Hill, in East Canyon, had long been a sacred spot whither the Indians repaired each year to hold councils and to obtain metal for bullets. Soldiers of General Connor's command, attracted by these legends, located a cropping of lead ore at the St. Louis lode, now known as the Hidden Treasure Mine. Thus began the exploitation of the mineral resources of Tooele County—a resource that has scarcely been scratched, although it already has yielded its millions.

In size, Tooele County ranks second among the counties in Utah. Within its boundaries are 4,719,360 acres, or an area almost as large as that of New Jersey. Great Salt Lake invades the northeastern part of the county and practically all the western half of the county, except the southwestern corner, is covered by the Great Salt Lake Desert. On the whole, the surface of the county is chiefly valuable for grazing, especially as a winter range for sheep. But many of the valleys are extremely fertile and yield profitable crops where water for irrigation is available. Inadequate water for irrigation purposes has done much to retard agricultural development although in recent years the application of dry-farming methods has brought considerable areas under cultivation in the eastern part of the county.

In Tooele Valley, situated just south of Great Salt Lake and in which is located Tooele City, the county seat, the major portion of the tillable land has been taken up and put under cultivation but it is possible that there may be some dry-farming land still available. In Rush Valley, south of Tooele, dry-farming has made good headway, especially in the southwestern part. In normal years the wheat yield on these dry farms averages around seventeen to twenty bushels to the acre, however, there are some tracts

that have yielded as high as thirty-five bushels to the acre. There are about 100,000 acres of dry-farming land in this section and water sufficient to care for culinary needs and to irrigate small orchards or gardens. Artesian water has been found in nearly every part of the valley. Dry-farming also is being practiced with success in the Cedar Valley, just over the mountains eastward from Rush Valley. The Skull Valley lies west of Rush and Tooele Valleys, and it, too, contains thousands of acres of excellent dry-farming lands. In the western half of the county, the Deep Creek Valley, in the southwestern corner, is almost the only district settled. Grain and hay are the principal crops and for these there is a ready home market supplied by the stock men who winter in that vicinity. The streams in the county are small and can supply irrigation water for only a limited area. Before any big irrigation development can take place it will be necessary to store waters in other sections and take it into the Tooele County valleys by means of long canals. It is the dream of some who have seen irrigation grow in this State, that some day the surplus waters from Utah Lake will be led around the eastern foothills of the Oquirrh for the reclamation of the fertile lands of Tooele and Cedar Valleys and probably some of Rush Valley also. With Salt Lake City scarcely fifty miles from any point in any of the three valleys, and adequate rail transportation, the irrigation of these lands would undoubtedly result in the cutting of the big farms into truck gardens and orchards.

Stock growing, of course, is a highly important industry in a region so peculiarly adapted to that line of effort. Ordinarily there are approximately a quarter of a million sheep and 10,000 head of cattle grazed annually in the county, representing a total value of three million dollars or more.

Two railroads traverse the county—the Los Angeles & Salt Lake railroad serving the eastern part from the south end of Great Salt Lake to the southern border, and the Western Pacific from the southern end of the lake to the Utah-Nevada line. With the exception of the Gold Hill section in the southwestern corner of the county, practically all the settlements of importance are in the eastern part. Besides Tooele City the important settlements in the eastern section are Grantsville, International, Stockton, St. Johns and Vernon. The development of the salt and potash industries in recent years has made the towns of Burmester and Salduro, along the Western Pacific, of more than ordinary importance. With but few exceptions, the principal

settlements of Tooele County were the result or in connection with mineral development.

Camp Floyd, of course, was a military camp originally, and it was due largely to the activities of the occupants of the post that the mining towns of Mercur, Ophir and Stockton were established. Mercur, which is in the Camp Floyd mining district, was one of the early-day gold camps and produced in excess of \$19,000,000 before operations were suspended. Stockton and Ophir are in the Rush Valley country and only a few miles apart. The two camps have a production record of nearly \$32,000,000. But little work has been done in the Stockton mines since about 1915 but some of the old mines at Ophir are working regularly. There are many persons, some mining experts, who firmly believe that some of the great ore bodies in both camps are yet to be discovered and prospecting work is carried on almost continuously.

The county as a whole probably is one of the most highly mineralized sections of such an area in the West. Besides the camps already mentioned there are the following organized mining districts in the county: Blue Bells, Clifton (Gold Hill), Columbia, Desert, Dugway, Erikson, Granite Mountain, Lakeside, North Tintic, Silver Islet, Tooele and Willow Springs. All have been active at one time or another and most of them are being prospected now. The Clifton or Gold Hill district produced sufficient ore a few years ago that a branch was built from the Western Pacific at Wendover to the town of Gold Hill. Most of the ores in that region are low-grade but there is a wide variety. Practically all the ordinary metals as well as some gold and silver are produced, and some tungsten and bismuth have been mined. The Dugway district is in the south-central part of the county and about forty miles from a railroad. Some very rich ore was taken from the old Buckhorn property in the early days of the camp and shipments of the better grades have been made from time to time since. It is one of the promising mineral sections of the State but better transportation facilities or the discovery of a bonanza will probably be necessary to enlist the aid of sufficient capital to carry on proper development.

At the town of International, about four miles northeast of Tooele City, is the smelting plant of the International Smelting Company which ordinarily gives employment to about 1,000 men. Not only ores from the nearby camps go to International for smelting, but ores from various other metal producing states of the Intermountain and Pacific coast regions.

But Tooele County's mineral resources are not confined to metals. In the western part, about the middle of the Great Salt Lake Desert, are vast beds of almost pure salt, left there by old Lake Bonneville. The area covered by the salt is probably sixty miles east and west by twenty miles north and south, and the salt varies in thickness from a few inches up to about twenty feet. The Western Pacific track is laid directly across this great deposit. For years the property was in litigation between the Federal and State Governments but since the trouble was settled about five years ago a consistent development program has been carried on, first by the Capell Salt Company and more recently by the Solvay Process Company, the latter being interested chiefly in the manufacture of potash.



POTASH AND SALT PLANT (Diamond Match Company)
Burmster, Tooele County.

Even before the Solvay Company became interested in the salt beds, the Diamond Match Company had begun to feel the pinch from the potash shortage brought on by the war and had begun the erection of a plant on the shore of Great Salt Lake at Grant's Station on the Western Pacific. The purpose of the plant was to treat the waters of the lake and make potash and this was accomplished, while salt was manufactured as a by-product.

About the same time the station at Grants was getting its name changed to Burmester, the Western Pacific was cutting in a siding a few miles from Grantsville to aid in opening up the enormous deposits of dolomitic and high cal-

cium lime and great beds of silica at the new camp of Dolomite. The manufacture of a really plastic dolomite lime hydrate was begun at that time and is rapidly growing into one of the big industries of the county. Opportunities for other and further development if capital and men of energy are available.

THE UINTAH BASIN

Uintah and Duchesne Counties

Embracing the western half of the Uintah Basin, one of the greatest undeveloped regions of the west, Duchesne and Uintah Counties form a vast treasurehouse of natural resources that will be unlocked with the arrival of rail transportation. Billions of barrels of oil in shales, billions of tons of coal, millions of tons of hydro-carbons, hundreds of thousands of acres of fertile land, water sufficient to irrigate many times the area and grazing lands equal in area to some of the New England states—these are a few of the things which await capital and transportation. And capital will not be long in coming when facilities for marketing the products are available.



TYPICAL GRAIN FIELD
Unitah Basin.

The Uintah Basin is a big, bowl-shaped area approximately 200 miles east and west and 80 miles north and south, and is about evenly divided between Utah and Colorado. Duchesne and Uintah Counties embrace Utah's portion and the conditions and interests of the two counties are so nearly identical and so much in common that it is difficult to treat them separately.

But the application of the term "undeveloped" in this instance does not mean that the region is unsettled, although there is room for many times the present popula-

tion. So rich are the resources and so abundant are opportunities that many settlers have been attracted there, and thriving agricultural, stockraising and mining communities have sprung up, confident that the time would not be far distant when the tonnage offered must bring the railroad to haul their products to market. The population of the two counties is approximately 25,000, and the property has an assessed valuation of about \$14,000,000.

These settlers have built thriving communities with handsome business blocks, churches, schools and homes, knowing that the railroad's advent will more than justify such expenditures of time, money and energy. The majority of them are keen business men from thickly populated areas. They dwell on the frontier in a sense, but it is not frontier community that the visitor or the railroad builder will find. Instead, it is a vast territory dotted with modern cities and productive mines and farms.

The grazing lands of the Uintah Basin are noted for their excellence. There is a certain amount of live stock scattered through the basin on the farms in accordance with the diversified farming methods followed by the pioneers. It is estimated that there are about 150,000 ewes in the basin. This breeding stock under range conditions yields an average increase of 75 per cent in addition to the wool. The number of cattle in the basin is estimated at 54,000; horses, 18,000; hogs, 8,000, the latter being on the increase. These estimates are substantiated by the records of the United States Forest Service, which practically controls the summer ranges of the region. Permits for grazing were issued last season for 340,000 head of live stock on the forests of the north and east rims of the basin.

In an arid region it is the water rather than the land which measures the agricultural possibilities, and the arid region irrigationist marvels at the abundant supply of water in the Uintah Basin. The Duchesne carries the waters of the western end of the basin into the Green River; and is itself fed by several important tributaries, including the Strawberry, the Lake Fork and the Uintah. Ashley Creek flows southeasterly through Vernal and the Ashley Valley into the Green. The Green itself, rising far to the north, traverses the basin in a general southwesterly direction, with immense possibilities both for storage and power.

The annual runoff of the basin is estimated at 3,370,000 acre feet. The Duchesne runoff alone in twenty years averaged 700,000 acre feet.

In the region drained by the Duchesne and its tribu-

taries power sites have been reported sufficient to develop 8,760 kilowatts. Ashley Creek can develop 18,900 kilowatts, while the Green River has possibilities for 136,000 kilowatts.

There are several proposed storage projects on the Duchesne and its tributaries, the most promising at present being the Castle Peak, which is under consideration by the United States Reclamation Service and proposes to store water to irrigate about 80,000 acres on the South Myton, Castle Peak and Parietta benches—situated partly in Duchesne and partly in Uintah Counties.

The tillable area of the Utah part of the basin is approximately 750,000 acres. Of this, 500,000 acres can be irrigated, the region being among the best watered in the semi-arid west. There are under cultivation by irrigation about 175,000 acres, the land being valued at prices ranging from \$25 to \$150 an acre.

So far there has been practically no attempt to store water for irrigation purposes, the regular flow of the streams sufficing for existing needs. The biggest project is the Dry Gulch, which takes water from the Lake Fork River and covers approximately 100,000 acres, of which probably 75,000 acres are under cultivation. This is a co-operative company owned by the landholders. The company has reservoir filings, but as yet has not found it necessary to store water to meet its needs. In the Ashley Valley there are approximately 50,000 acres under ditch, the water being taken from Ashley and Brush Creeks. Among other private and co-operative projects are the Ouray Valley, the Colorado Park, the Duchesne and Farmington Canal Companies and the Blue Bench. In addition to these, the United States Indian Department has put thousands of acres under ditch for its wards, and more and more of the acreage is being put under cultivation each year and in most instances the improved lands are subject to lease to white settlers at nominal figures. In this connection it might be well to observe that the White River also is available for irrigation and power purposes in southeastern Uintah County. It has an annual runoff of about 475,000 acre feet and can be utilized for the reclamation of the Dead Man's Bench country which embraces about 40,000 acres of tillable land.

Dry-land farming also is practiced to a limited extent and could be applied much more extensively if occasion arose, but at present there is such a large acreage under canal that there has been little need for dry farming.

The average annual yields per acre from irrigated lands are: Alfalfa, four tons; wheat, about 30 bushels; oats and barley, 80 bushels; corn, in some sections, 75 bushels. Po-

tatoes, melons, apples, peaches, pears, apricots, prunes and grapes are grown in quantity. Annual production from about one-third of the irrigable land in the basin gives the following totals which could be increased from seven to ten-fold with marketing facilities and an adequate labor supply: Hay, 150,000 tons; wheat, 750,000 bushels; oats, 650,000 bushels; corn, about 190,000 bushels; potatoes, 270,000 bushels. In 1917 the basin country produced 557,348 pounds of beans.

Experiments have demonstrated that the successful culture of sugar beets of high saccharine content is possible. Up to this time, however, this branch of industry has been neglected because of lack of transportation facilities precluding the establishment of beet sugar factories.

National forests in the area tributary to the basin in Utah cover 1,978,400 acres and have 701,000,000 feet of merchantable timber according to the latest estimates prepared by the office of the district forester. The forests are largely on the Uintah mountains and in them are hundreds of beautiful little lakes which are not only the sources of the basin's water supply, but furnish some of the finest trout fishing in the country. Some big game also is found in that region.

The basin region is one of the greatest honey sections in the west. Thousands of tons of honey of a quality unexcelled are produced annually and marketed in all parts of the country by parcel post. The federal government has put on a line of more than a score of motor trucks to handle the mail to and from the basin, practically all of it being moved by way of Helper or Price on the Denver & Rio Grande railroad. Duchesne County is not touched by a railroad but there is a narrow gauge line extending from Mack, Colorado, into the gilsonite fields of Uintah County. The northern terminus of the line is Watson, about 52 miles from Vernal, the county seat of Uintah County. The line is about 60 miles in length and crosses the mountains by way of Baxter Pass, with a grade of $7\frac{1}{2}$ per cent.

The principal towns in Uintah County are Vernal, Jensen, Maeser, Whiterocks, Ouray, Randlett, Moffatt, Watson, Dragon and Fort Duchesne. Vernal is a modern little city and the commercial center of the county. The Indian agency is situated at Fort Duchesne and Ouray and Whiterocks are branch agencies.

In Duchesne County the principal towns are Duchesne, the county seat, at the head of the Duchesne Valley; Roosevelt, a prosperous and rapidly growing town in the heart

of the Dry Gulch project; Myton, in the center of the irrigated Indian lands region; Tabiona, Mountain Home, Boneta, Talmage, Altonah, Bluebell, Hanna, Redcap and Upalco.

Flour mills of the most modern type have been erected at several points in the basin to care for the wheat grown. In the vicinity of Vernal the growing of canning vegetables and fruits has been stimulated to a considerable degree by the establishment of a canning plant at Vernal. The entire section also is ideal for dairying and this industry has been receiving some attention since the establishment of a branch of the Mutual Creamery Company at Duchesne. The erection of another plant at Roosevelt is in contemplation.

Geologists are of the opinion that the entire basin is underlaid with coal-bearing strata. Some of the more im-



MODERN BANK AND OFFICE BUILDING

Vernal, Utah County.

(Built From Brick Shipped in by Parcel Post.)

portant fields have been investigated by the United States Geological Survey. The Blacktail or Tabby Mountain field is in the western part of the basin and mostly in Duchesne County. The field covers an area of about 150 square miles and the tonnage is estimated at 1,857,000,000 tons. The coal is a good, low-grade bituminous with good stocking qualities but is non-coking. The deposit has been opened up in several places to supply local needs.

The Deep Creek or Vernal field is situated west of Vernal and north of Fort Duchesne and covers an area of

about 25 square miles. The coal is a low-grade bituminous and similar generally to that of the Tabby Mountain field. Some mining has been done to supply the government needs at Fort Duchesne and to care for the wants of the settlers nearby. Near Vernal several properties have been operated for years to supply the fuel wants of Vernal, Maeser and Jensen. The tonnage is estimated at approximately 35,000,000 tons.

The United States Geological Survey estimates that seven thousand square miles in northeastern Utah and northwestern Colorado are underlaid with oil shales. In Utah the major portions of Uintah and Duchesne Counties are underlain by these shales, which contain organic matter that may be converted into crude petroleum by destructive distillation.



SHALE BEDS

Where the White River Has Cut Shale Beds in Uintah County

Dean E. Winchester, who investigated the field for the Geological Survey, estimates that the Utah shales in the basin region contain 42,800,000,000 barrels of crude petroleum and perhaps 500,000,000 tons of ammonium sulphate. In many places, he suggests, steam shovel mining can be carried on without difficulty. Samples of rock were discovered by the exploration party that ran as high as 90 gallons of oil to the ton, although the general average would

be not more than half that quantity, probably about one barrel or 42 gallons to the ton.

Some time ago the Ute Oil Company began the construction of a shale reduction plant near White River station, about ten miles north of Watson. The plans of the company contemplated the construction of a plant with a capacity of about 400 tons of shale daily at a cost of about \$800,000. The work has progressed slowly, however, and no production has been reported. In the vicinity of Watson there has been erected recently a test plant employing the Galloup process which is reported to have operated very successfully. The Ute Oil Company is using the Wallace process.

The oil wells of the basin, as such, are on the Colorado side of the line just as gilsonite is confined to Utah. Some formations which appear favorable to oil production are found in the vicinity of Moffatt and between Moffatt and Vernal. Some wells are being put down in this district but they have not yet attained a depth at which oil is expected.

Asphaltic sands, sometimes called rock asphalt and sometimes oil sands, are found near Whiterocks, Upper Deep Creek and west of Vernal. At Vernal and Fort Duchesne the native product has been used extensively for sidewalks and street paving.

Uintaite or gilsonite occurs almost exclusively in Utah although the largest veins are situated near the Colorado line. It is used for high grade paints, black varnish for smokestacks and chemical containers and as a preservative against sea water or weather; in the manufacture of lubricants, mineral rubber and paving material. The available tonnage is estimated at 150,000,000 tons. Among the bigger properties now operated are those at Dragon, Rainbow, near Watson and Castle Peak. The Rainbow is the principal producer, its output being about 75 tons a day, or about 80 per cent of the State's production. The product is worth about \$25 a ton delivered at Mack, Colorado. Gilsonite also occurs in the vicinity of Fort Duchesne where the oldest workings in the State are situated.

Elaterite, a higher grade hydro-carbon than gilsonite, is found in the western part of the basin, almost exclusively in Duchesne and Wasatch Counties. The available quantity is estimated at 50,000 tons.

Closely akin to elaterite is wurtzilite, which is found in the western part of the basin also. Another similar composition is tabbyite, which is used to a limited extent as a rubber substitute, the limitation being due largely to the quantity available. Weggerite is of the same family

and is available in almost unlimited quantities. Grahamite, albertite and other forms of hydro-carbons are also present in the basin region though not highly developed.

The presence of phosphate in the basin has been a matter of common knowledge for many years but owing to the isolation from rail transportation no effort toward development has been made. During the war period the Geological Survey made some investigations and expressed the opinion that phosphate beds extend along the Uintah Mountains on both sides from the Wasatch range to Split mountain, east of Jensen. In most places the deposit is reported to carry 70 per cent tricalcium phosphate or better and the tonnage is so great that the limited investigations do not justify an estimate.

On Douglas Mountain east of Vernal some promising metal deposits have been discovered but the distance to the railroad has precluded development. Placer mining for gold has been practiced for many years along the Green River with varying success, the gold being so fine that difficulty has been experienced in working the sands at a profit.

The Uintah Basin is an empire awaiting development. A railroad and more settlers will make it one of the great productive regions of the West.

UTAH COUNTY

Inasmuch as Provo, the county seat, has been accorded recognition as the "garden city" the residents of Utah County are justified in the assumption that their county merits recognition as the garden county of the State. They have the soil, the broad valley lands, the mountain streams, the biggest body of fresh water in the State and they have the citizenship with the will and the inclination to make Utah County the greatest agricultural section of the State. And they are sparing no effort in doing it.

Utah County is one of the medium sized political divisions of the State. It has an area of 2,342 square miles—1,498,880 acres—of which one-third or more is included in the Nebo, Wasatch and Uintah National Forests. Utah Lake occupies in excess of another hundred thousand acres and about 500,000 acres are in private ownership or are in the process of acquisition by homesteaders. Forest covered mountains occupy practically the entire eastern third of the county and form a great storage for winter precipitation which supplies the water for irrigation in the summer season. West of the mountains is the beautiful Utah Valley, one of the most productive and one of the larger valleys of the State, and several smaller valleys of equal productivity.

The Utah Valley is the most highly developed of them all, although in recent years the construction of the Strawberry project has brought thousands of acres of bench lands in the Goshen and other small valleys under cultivation in the southern part of the county. Down the Utah Valley on the east side of Utah Lake the country is so thickly settled that it is difficult at times to determine where one prosperous town ends and another starts. From the Jordan Narrows on the north, which mark the northern boundary of the valley and the county, there are the towns of Lehi, American Fork, Pleasant Grove, Orem, Provo, Springville, Spanish Fork, Salem, Lakeshore, Geneva and Benjamin, with Santaquin perched on the ridge at the southern end of the valley, and around the foothills the settlements of Goshen and Elberta. All are thriving and prosperous communities and most of them have water systems, power for lighting and pumping, sidewalks, and in the larger towns, paved streets.

The county is ideally situated for any kind of farming, except that the high yields from fruit and vegetable crops make the lands in many instances too valuable to be de-

voted to hay and grain except as rotation crops. Sugar beets, too, must be figured in the highly valuable crops which make land prices soar. Utah county is immediately south of Salt Lake County, with which it is connected by a hard-surfaced highway, two steam and one electric inter-urban line. The highway and all the railroads traverse that section of the valley between the lake and the mountains and supply all transportation facilities necessary to hurry crops and produce to the Salt Lake market only a few miles away.



BUSINESS SECTION
Provo, Utah

On the west side of the lake development is not so far advanced. The principal water supply for irrigation must come from Utah Lake and because of the elevation it usually must be pumped. In the main, the improvements on the west side have been confined to individual efforts on the part of the settlers, although the Mosida project, embracing several thousand acres, was launched as a pumping project several years ago, only to meet with financial difficulties which have seriously handicapped development.

The country between the mountains and the lake is exceptionally well watered. Besides the water from the various streams and some from Utah Lake, this section is served also by the only Government reclamation project yet completed in the State—the Strawberry. The waters of the Strawberry River across the divide east of the valley are stored in a reservoir covering the major portion of the Strawberry Valley. This water is brought through the

Wasatch Mountains by means of a tunnel and down the Spanish Fork River to the southern part of the Utah Valley, thereby reclaiming approximately 60,000 acres of land in the vicinity of Spanish Fork, Payson, Salem and Goshen. A few years ago thousands of acres of bench lands were still in the public domain and others could be bought for \$10 to \$25 an acre. With the completion of the Strawberry project these same lands have come under cultivation and command \$100 to \$200 or more an acre.

In this stretch of country from Lehi to Payson, a distance of about 45 miles, there are four sugar factories in operation. The oldest factory in Utah is situated at Lehi and besides the beets handled at the plant, thousands of tons are cut at a cutting station farther south and near the lake and piped to Lehi to be manufactured into sugar. The second sugar factory in the county was established at Payson several years ago and more recently beet sugar factories have been erected at Springville and



HARVESTING WHEAT

The Background Shows a Typical Rural Community in Utah County

Spanish Fork. Reports indicate that there were 18,500 acres planted to beets in the county this season. The average yield is about 12 tons to the acre, and the guaranteed price this year is \$12 a ton, meaning that the beet sugar industry will bring to the Utah County farmers this year approximately \$2,500,000.

The fruit crop ordinarily will bring about a million dollars to the county, besides the vegetables and canning crops. Apples, peaches, pears, cherries and strawberries are the principal fruit crops and are grown to a greater or lesser extent in practically all parts of the valley. The

larger fruits are grown more extensively, however, in the vicinity of American Fork, Pleasant Grove, Springville and on the Provo and Mapleton Benches. The peaches, apples and pears produced on the Provo and Mapleton Benches are of unusual quality and attain considerable size. They are moved extensively in carload shipments to Salt Lake and eastern markets. The average production of peaches is about 1,200 cases to the acre; apples, 800 bushels; strawberries, 400 to 600 double cases, and sweet cherries, 10,000 pounds.

Potatoes, onions and tomatoes also are profitable crops. Onions and potatoes yield \$400 to \$800 an acre, while the tomato yield is from fifteen to twenty tons to the acre. Canneries have been established at various points through the valley to care for tomatoes, peas and other fruit and vegetable crops. The potato production for the past season is estimated at 450,000 bushels.

The mountain forests supply fine summer grazing and the livestock industry has not been neglected. Last season there were 28,000 head of cattle reported and 26,300 sheep. The sheep are wintered on the desert usually, but hay and grain are grown for winter feeding of the stock kept on the farms. The alfalfa production this year is estimated at 80,000 tons and there were approximately 35,000 acres planted to the various grains, about half to spring wheat.

With ideal conditions locally and a nearby market and excellent transportation facilities, dairying is a profitable and growing industry. Most of the milk and dairy products are sent to Salt Lake but a milk condensory is being erected at American Fork by the Mutual Creamery Company.

Provo is the principal city of the county and the third city in size in the State. It is a modern little city of approximately 10,000 inhabitants and is situated about 45 miles south of Salt Lake City. Besides the canning factories it has candy factories and woolen mills, and several other important manufacturing establishments. Besides its public schools it has the Brigham Young University, one of the important institutions supported by the dominant church, and Proctor Academy, a Congregational school.

Although attention is given chiefly to agricultural pursuits, the county has three important mining districts—the East Tintic, the Santaquin and American Fork—with promising properties under development.

Utah County also offers exceptional opportunities to the vacationist and the sportsmen. Utah Lake abounds in bass and the mountain streams in trout. Back of Provo is Mt. Timpanogos, the highest peak in the Wasatch range,

and on which is Utah's only glacier. Hiking trips to the glacier and the summit of the mountain are conducted annually by the residents of the county, usually under the auspices of the Brigham Young University faculty. But independent trips are made almost weekly by individuals and private parties during the summer months.



UPPER FALLS
Provo Canyon, Utah County



BEAUTIFUL PROVO CANYON
UTAH COUNTY

For the western country, Utah County is a well settled and highly developed region but there is ample room for many times its present population.

WASATCH COUNTY

Situated on the ridgepole of the State, Wasatch County maintains without serious effort its claim as the highest county in Utah. The general elevation is approximately 7,000 feet above sea level, which is about 3,000 feet higher than the Salt Lake Valley. It is a magnificently watered section, the Provo, Weber and Strawberry Rivers and their tributaries traversing the principal valleys of the county. Natural conditions make it especially adapted to stock raising, and Heber City, the county seat, is probably the greatest originating and destination stock shipping point in the State. Except for a branch of the Denver & Rio Grande from Provo to Heber City, and the short distance the main line of the Denver & Rio Grande cuts across the south-western corner, Wasatch County is without rail transportation. It is served, however, by good highways connecting the Heber Valley towns with Provo and Park City and Salt Lake.

Some interesting information concerning the resources, development and opportunities in the county is supplied by E. Parley Cliff, secretary of the Heber City Boosters' Club, as follows:

"One of the most beautiful valleys in the world is a comment often heard from tourists who pass through the beautiful Provo Valley during the summer season. Heber City, the thriving county seat of Wasatch County, is located in the center of the valley. It has a population of about 2,500, owns as a municipality its water system and electric light plant, is noted for its most substantial public school buildings, beautiful churches, attractive residences and hospitable people.

"Heber City was named in honor of one of Utah's great pioneer leaders, and the valley takes its name from the Provo River, which flows through the valley on its way to Utah Lake. The county is called Wasatch because it is in the midst of the Wasatch range of mountains.

"A branch line of the Denver & Rio Grande Railroad runs from Provo City, twenty-six miles distant, through Provo Canyon, one of the most picturesque and widely known summer resort sections in the West, to the branch terminus at Heber City. Heber also is one of the important points on the Pike's Peak-Ocean-to-Ocean Highway, over which thousands of tourists pass each year on their way to and from the Pacific coast. Wasatch County is famous for its thoroughbred cattle, sheep, horses and swine, Charles-

ton, six miles south of Heber, being the home of several breeders of national reputation.

"The natural grasses and feed of the valley as well as the high mountain ranges nearby are particularly adapted to the production of some of the best beef, mutton and pork to be found anywhere. More native sheep are shipped to market from Heber than from any other point in the United States, Heber being the nearest shipping point for the numerous flocks that graze on the Uintah National Forest. Many of the flockmasters are residents of Heber City and their lambs always bring top prices on the eastern markets. There are also about 125 cars of beef cattle shipped to the eastern and western markets from Heber each year.

"Wasatch County is admirably adapted and situated to become the leading dairy section of the Intermountain region. The foremost company of its kind in the west, the Mutual Creamery Company, has just completed and put in operation two modern cheese factories at the cost of \$30,000, one being located at Heber City and the other at Midway, four miles west. These, together with others yet to be built in the near future, are known as the Alpine system of the creamery company, so named because nowhere else are conditions so nearly like those of the Alpine districts of Switzerland, recognized the world over as ideal for the production of cheese and other dairy products.

"At the recent exhibition of the Pacific International Live Stock and Western Dairy Show held at Portland, Oregon, Heber cheese took first prize and the gold medal. During the month of September, the first month the plants were operated, 124,202 pounds of milk, which produced 13,662 pounds of cheese, were received by the two stations. The Clover Leaf Dairy of Charleston has been in operation six years and ships to the Salt Lake market daily over one ton of pasteurized milk and cream.

"In the year 1918 the Woods Cross Canning Company erected a modern pea cannery at Heber City. Six grades and several varieties of the best peas are canned here. This is proving to be a profitable industry for both manufacturers and farmers, and land values have nearly doubled in the last two years, mainly as a result of the establishment of the pea cannery. The company has found that peas of the most excellent quality can be taken care of. The plant has a capacity of 60,000 cases a year, and 400 acres of peas were planted last year. Viner stations are being established in various sections of the county, the shelled peas being moved by auto truck to the factory. About 4,000 tons of sugar beets are raised annually in the county. In

this connection it is worthy of note that the Utah-Idaho Sugar Company, after experimenting in sugar beet seed culture in various places, decided to make this section one of its principal and permanent fields for growing sugar beet seed.

"No article on Wasatch County would be complete without mention of the famous Midway Hot Pots, near Midway, on the west side of the valley. These are natural mineral springs, whose temperature ranges from lukewarm to nearly boiling, and which have formed themselves into curious-looking "pots." The water is piped from the pots to bath-houses nearby, and thousands enjoy the pleasure of a dip into the tepid water during the summer season. In fact, nearly every one who visits Wasatch County takes a bath in her famous "pots."

"Good roads are rapidly being built into and through Wasatch County, over \$100,000 having been spent by the federal, state and county officials during 1919, and with the natural resources, the cool climate, beautiful scenery and favorable location of the county, this section is destined to become the greatest summer resort in the West. The Heber Boosters' Club extends a hearty welcome to all desiring an ideal summer home.

"The Strawberry, project, the larger part of which is in Wasatch County, provides for the storage of water in a reservoir on the Strawberry River; the discharge of the stored water through the Strawberry tunnel, approximately three and three-quarters miles long, into Diamond Fork, a tributary of the Spanish Fork River, and the diversion of water from the Spanish Fork River into canal systems, watering lands east and south of Utah Lake in Utah County. A hydro-electric plant on the south side of the river supplies power for construction and commercial purposes. Part of the power developed may ultimately be used for pumping water for irrigation of high lands and drainage of low lands. The United States claims all the waste, seepage and unappropriated spring and percolating water arising within the project and purposes to use such water in connection therewith."

With the transfer of the division point of the Denver & Rio Grande Railroad from Helper, in Carbon County, to Soldier Summit, Wasatch County recently has acquired another thriving community. A reservoir has been constructed recently with a capacity of a million and a half gallons of water to supply water for the town and the railroad. Residences are very much in demand and the erection of probably two hundred homes will be necessary

to care for the demand. The construction of a \$50,000 Y. M. C. A. also is contemplated.

In the vicinity of Soldier Summit is found one of the rare hydro-carbons—ozokerite. Some sporadic efforts have been made to mine the mineral, for which there is a ready market, but so far the development of the industry has been slow. To the east of Soldier Summit is found another hydro-carbon which is almost as rare as ozokerite. This mineral is known as elaterite. The principal property being operated is in Indian Canyon and the product is hauled from the mine to the railroad by wagon.

In the northeastern part of the county are extensive deposits of hematite iron, the development of which must await the coming of rail transportation. The same condition obtains with reference to the extensive deposits of bituminous coal in the eastern part of the county. Croppings of coal have been found along Currant Creek and Red Creek and toward the headwaters of the Duchesne. The field is listed by the United States Geological Survey as the Tabby or Blacktail Mountain field. Some local mines are operated to obtain fuel for local use and to supply some of the nearer Uintah Basin towns. The field is nearer by direct line to Salt Lake City than the mines of Carbon County and with rail transportation would figure considerably in the coal production of the State.

WAYNE COUNTY

Off the main traveled highways of the State and with much of its area unsurveyed and unexplored, Wayne County should carry a strong appeal to those who seek the opportunities of the new and open country. In actual miles Wayne County is not nearly so far from the shriek of the locomotive as several other Utah counties but it just so happens that it is hemmed in away from main traveled roads in such a manner as to lend impression of unusual isolation. It is a sparsely settled county, mainly due, probably, to its awkward situation with regard to inter-county lines of communication.

Like most of the counties of the south, Wayne devotes its attention very largely to stock raising, the mountain forests in the northwestern part furnishing fine summer grazing and the warm and open country in south and east supplying a winter range difficult to surpass.

Agricultural efforts are confined chiefly to the production of hay and grain as an adjunct to stock raising. The valley lands are very fertile and in most instances ample water for their irrigation is available from mountain streams. In the warmer portion in the south small fruits of good size and quality yield abundantly.

The eastern portion of the county, insofar as it has been explored, is heavily mineralized. Coal croppings are frequent and apparently vast deposits underly a large portion of that part of the county. Some interesting metal discoveries have been reported, too, but in neither the case of the coal nor the case of the metals has sufficient development been done or undertaken as to reflect other than vaguely the resources of the region.

Wayne, too, comes within the range of probability in relation to oil and development planned for the coming year in the San Rafael region which practically reaches into the northern border of Wayne, is expected to reflect with considerable accuracy the oil possibilities in Wayne County.

In this same eastern part of the county there have been discovered in recent years a number of deposits of carnotite ores. It appears that this section is included in the carnotite district of which southern Grand County is the center, and which is reckoned as one of the greatest and probably the greatest uranium belt in the world.

Despite a rather small population for the county as a whole, there are a number of thriving little towns. Loa,

on the headwaters of the Fremont or Dirty Devil River, is the county seat and principal town. Among other towns in the county are Fremont, Thurber, Torrey, Teasdale, Lyman, Fruita, Grover, Giles and Hanksville.

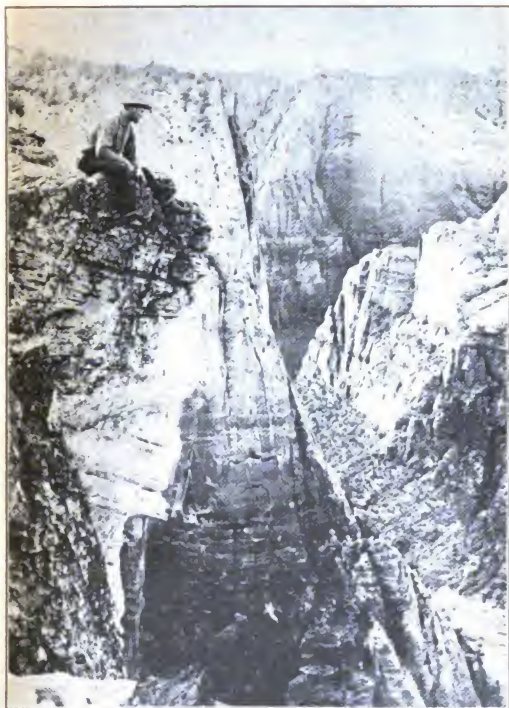
Because it is off the beaten path, Wayne County is reported to offer some of the best hunting and fishing in the State. Almost touching the northwest corner of the county is Fish Lake and in this vicinity the hunter and the angler enjoy their greatest opportunities. And the county as a whole offers notable opportunities to the home seeker, the investor and the prospector.

WASHINGTON COUNTY

General Crook and Geronimo had not started their animated discussion of certain phases of border etiquette in the vicinity of Arizona's future Pima cotton belt when the Mormon pioneers were raising cotton in Washington County to provide themselves with clothing. While the Argonauts were digging and scratching California's soil in search of gold, these same Washington County settlers were planting orchards and vineyards. Yet it took the motor car and the modern highway, and, more recently, the creation of Zion National Park, to bring a true realization of the unusual opportunities and the wonderful charm of Utah's Dixie Land.

Below the southern rim of the Great Basin in the southwestern corner of the State, Washington County probably affords the lowest altitude in all Utah and a climate that approaches the semi-tropical. Its lowlands are principally along the Rio Virgin, with altitude ranging from 2,800 at St. George to about 4,000 at Springdale, at the portal of Zion National Park. Then come the mesa lands at altitudes ranging from 3,500 to 5,000 feet and which produce very profitable crops of grain in the sections where precipitation is heaviest. Above the mesas are numerous little mountain valleys of unusual fertility and in most instances they are well watered from mountain streams. The precipitation ranges from about eight inches annually in the lowland country around St. George to 17 inches on the mesa at Enterprise and 22 inches in the mountain valleys at New Harmony and Pine Valley. Snow is common in the mountains during the winter and not infrequent on the mesas but snowfall in the lower country around St. George is an event.

Because of its moderate climate and its enchanting atmosphere the lowland country in Washington County looks forward to the day when it will be the winter playground for the Intermountain region. Ninety miles from a railroad is a handicap which it is no easy matter to overcome, especially when highway improvement is only getting well under way in the region. However, road building and the motor car already have done much toward opening up the country and with the prospect that in the not far distant future there will be a hard-surfaced highway between Salt Lake City and Los Angeles, the people of the Intermountain country—those of Washington County in particular—are awakening to the possibilities the future



ZION NATIONAL PARK
From Rim — Washington County

holds in store for Dixie Land. The mean temperature for the year normally at St. George is about 58 degrees. The coolest month normally is January with a mean temperature of 38, and the warmest month is July with a mean temperature of 83.

Utah's Dixie Land is a region of sunshine and flowers, the country of the fig and the pomengranate. The valley of the Rio Virgin is extremely fertile and with adequate transportation facilities would rival the famous Santa Clara Valley of California as a prune and apricot region, the Fresno country for its grapes and raisins, Imperial Valley for its melons and the valley of the Sacramento for truck gardens. As for peaches, after inspecting the display of Dixie peaches at the Irrigation Congress at Sacramento, Luther Burbank expressed himself "In all my life I have never seen such a magnificent display of peaches." Then there are figs and almonds and English walnuts and pomengranates and mayhap olives. With a climate which is not oppressive in the summer, during the other three seasons equal to the best that the country south of the Tehachupis can offer at any season and without the disagreeable fogs, Washington County has demonstrated its ability to grow successfully and of excellent quality almost any fruit common to the country north of the Rio Grande except those of the citrus family and the date palm.

Down in the vicinity of St. George, Santa Clara and Washington fruits have been a staple crop since pioneer days, as was cotton until the old cotton mill at Washington was unable to meet the competition of the Southern states only a few years ago. About a dozen years ago some three-score families, driven from the upper reaches of the Rio Virgin by the floods of the wayward and turbulent stream, founded on Hurricane Bench the town of Hurricane. Water to slake the desert's thirst was brought by long canals from the Rio Virgin. Today, Hurricane is a thriving city of some two thousand souls, one of the most prosperous communities in the State, and the surrounding country presents a scene seldom visioned except on theater drop curtains. And there are 30,000 to 40,000 acres more stretching from Hurricane southward across the Arizona border, all of the same character and which, at no far distant date, will have water led upon it and begin to blossom as the rose. Just bear in mind—eleven growing months and five crops of alfalfa.

But Washington County need not depend upon products of the soil alone for future greatness. In its hills there is a wealth of minerals—coal, iron, gold, silver, copper and

perhaps some lead—and in the valleys, or some of them, there is oil. And up in the northeastern corner of the county is another natural resource from which it expects more probably than any other—Zion National Park, the newest of our great national playgrounds.



**BIRD'S EYE VIEW HURRICANE VALLEY,
Washington County**

Just about fifty years ago Washington County was experiencing its first real mining boom following the discovery of the remarkable silver deposits in sandstone west of Leeds. Almost overnight a prosperous and exceedingly active camp was established and given the name Silver Reef, although the district is known as the Harrisburg mining district. Records of production are very incomplete and estimates vary all the way from seven to twenty million dollars. The ore started at the grass roots and the predominant metal was silver with the copper content increasing with depth. Because of poor transportation it was necessary to mill the ore at the camp and the old-time pan amalgamation process was used. This process worked satisfactorily until the copper content of the ore reached the point where it ate up so much mercury as to make the cost of production prohibitive. Then Silver Reef died and today untold millions in metals are locked in the sandstone reefs awaiting the development of a satisfactory process for treating the ores. Millions of pounds of high-grade copper

have been shipped from the Tutsugabut district southwest of St. George and with rail transportation it would be possible to operate on a considerable scale in this region. There are some silver-lead properties in the Tutsugabut district and in the Pine Valley country, while in Bull Valley are found the extensions of the famous Iron County iron field, probably the greatest deposit of high-grade iron in western America. In Bull Valley, too, gold, silver, lead and copper ores are found, and at intervals the reports of gold finds result in a stampede in that direction.

Early settlers found coal almost anthracite in character in the vicinity of New Harmony and in the mountains south of Cedar City in the northern part of the county they discovered a bituminous coal. In more recent years channel coal has been found along the north fork of the Virgin River above Zion National Park. The coal around New Harmony is partly semi-anthracite and partly bituminous but is rather dirty and the vein is not more than about six feet in thickness at any point it has been opened up. No mining has been done except to supply local needs. The coal at New Harmony is in the New Harmony field while the bituminous coal to the north and the channel coal are in the Colob Plateau field.

Oil was discovered in the vicinity of Virgin City about a dozen years ago at a depth of about 500 feet. The oil was of a good grade and the find created considerable excitement. Several wells were put down when the government made extensive withdrawals of public land in the region as oil lands. This and the financial stringency about that time put an end to operations until some three or four years ago. The withdrawals extended from the Virgin City section down into Arizona and east into Kane County, most of which are now subject to development under the provisions of the leasing law.

Zion National Park now is one of our national institutions and its inclusion among our great playgrounds is significant of its importance among the scenic attractions of the continent. It defies description. It is a masterpiece of nature's handiwork—a great cleft in the mountains with the sheer walls and imposing battlement of the Yosemite, and the brilliant colorings and lavender haze of the Grand Canyon. A good highway has been built into the park and excellent accommodations are afforded at the Wylie camp about a mile or so inside the park. Stage service is provided between the park and the Los Angeles & Salt Lake railroad station at Lund, Utah.

The settlements in the county are pretty well confined

to the Virgin River country where are found the towns of Springdale, Rockville, Grafton, Virgin City, Toquerville, La Verkin, Leeds, Harrisburg, Washington, Hurricane, St. George and Santa Clara, all of which are in the fruit belt. To the north and west of the Virgin River country are the settlements of Pine Valley, Grass Valley, New Harmony, Gunlock and Enterprise. Enterprise is one of the newer towns in the dry-farming country and has enjoyed a remarkable growth in view of conditions. It is a modern settlement, which is being improved rapidly by the development of adjoining lands through irrigation from wells or project construction. Hurricane and St. George are the strongest communities but Enterprise must be reckoned with before many years have passed.

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920.**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
BEAVER COUNTY								
School Districts	None							
Cities and Towns—	\$ 25,000.00	Building	5 1/2 %		5 yrs			
Milford	20,000.00	Water			20 yrs			
	3,000.00	Sewer			5 yrs			
Beaver City	30,000.00	Water	6 %	1914	1934	1924		None
	8,000.00	Sidewalk	5 1/2 %	1917	1937	1927		None
	4,000.00	Water	5 1/2 %	1917	1937	1927		None
BOX ELDER COUNTY	175,000.00	Road	4 1/2 %	1912	1932		\$107,213.72	\$ 67,786.28
School District	200,000.00	Building	4 1/2 %	1912	1932			39,133.55
	20,000.00	Building	5 %	1905	1925			11,653.91
Cities and Towns—								
Brigham	30,000.00	Electric Lights	4 1/2 %	1902	1922	1912		20,176.88
	8,000.00	General	5 1/2 %	1905	1925	1915		3,427.84
	35,000.00	Water Works	5 %	1912	1932	1922		3,545.62
	80,000.00	Water Works	5 1/2 %	1917	1937	1927		10,043.33
Garland	6,000.00	Sewer	5 %	1912	1927	1917		1,259.35
	38,000.00	Water	5 1/2 %	1916	1936	1931		2,519.20
Honeyville	15,000.00	Water & E. lights	5 %	1911	1931		11,500.00	3,114.00
Tremonton	6,000.00	Water	6 %	1910	1930			2,400.00
	7,000.00	Water	6 %	1915	1935			1,400.00
	40,000.00	Water	5 1/2 %	1919	1939			

BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
BOX ELDER COUNTY—Continued								
Willard	9,000.00	Water	5	1910	1930			8,000.00
Fielding								
CACHE COUNTY								
School District	None							
Cities and Towns—	150,000.00	Building	4½	1911	1931	1921		8,700.00
Newton	6,300.00	Water	5	1911	1931	1921		1,577.29
	12,500.00	Water	5	1916	1936	1926		145.49
Logan	45,000.00	General	4½	1907	1927			None
	65,000.00	Electric light	4	1903	1923			None
	40,000.00	Water	5	1913	1933			None
	70,000.00	Water	5	1916	1936			None
	15,000.00	Electric lights	5	1916	1936			None
Millville	8,000.00	Electric Lights	6	1919	1939	1929		
Paradise	14,400.00	Water	6	1919	1939			
Hyrum	10,500.00	Electric Lights	5	1911	1931	1921		None
	22,000.00	Water	6	1913	1933	1923		None
Mendon	10,000.00	Water	5	1912	1932	1922		3,000.00
Clarkston	9,000.00	Water	6	1915	1935	1925		2,250.00

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
CACHE COUNTY—Continued								
Lewiston	47,000.00 Water		5 "	1913	1923	1923		18,828.40
	18,000.00 Water		6 "	1915	1935	1925		5,689.40
Smithfield	1,000.00 Water		5 1/2 "	1920		\$1000 each year 1925-1928 (inc)		
Hyde Park	3,000.00 Water		5 "	1912	1932	1922		
	3,345.00 Water		5 "	1912	1932	1922		
	8,000.00 Water		6 "	1918	1938	1928		4,625.00
Providence	2,000.00 Hall			1920				
Wellsville	11,600.00 Water							
	11,700.00 Electric Lights							
Logan School	35,000.00 Building		5 "	1911	1931	1921		
	80,000.00 Building		4 1/2 "	1916	1936	1926		12,000.00
	8,000.00 Building		5 "	1918	1928			
CARBON COUNTY:								
	10,000.00 Court House		5 "	1909	1929	1919		
	31,000.00 Roads		5 "	1911	1931	1921		
	30,000.00 Roads		5 "	1915	1935	1925		
	125,000.00 Roads		5 "	1919	1939	1929		
	150,000.00 Roads		6 "	1920	1940	1930		
School District	203,500.00 Building							21,063.00

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
CARBON COUNTY—Continued								
Cities and Towns—								
Price	9,000.00	Electric Lights	6 %	1910	1930	1920		
	14,000.00	Water and light	6 %	1911	1931	1921		
	12,000.00	Water and light	6 %	1913	1933	1923		8,318.02
	10,000.00	Water	6 %	1915	1935	1925		
	17,000.00	Water extension	6 %	1919	1939	1934		
Wellington	4,500.00	Water	6 %	1920	1940	1935		500.00
	10,000.00	Water	6 %	1920	1940			
Helper	15,000.00	Electric lights	5 %	1912	1932			4,000.00
	22,000.00	Water	6 %	1915	1935			4,000.00
DAVIS COUNTY								
	None							
School District	13,000.00	Building	5 %	1905	1925	1909	10,000.00	1,300.00
	12,000.00	Building	5 %	1908	1928	1913		3,700.00
	20,000.00	Building	5 %	1911	1931			
Cities and Towns—								
Centerville	15,000.00	Water	5½ %	1916	1936	1926		None
Kaysville	25,000.00	Water	5 %					None
Bountiful	35,000.00	Water	5 %	1910	1930			None
Farmington	10,000.00	Water	6½ %	1923			5,000.00	None

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
DAGGET COUNTY								
Daggett School District	None							
	2,500.00	Building	6 $\frac{1}{2}$	1918	1938			672.00
DUCHESTER COUNTY								
Duchesne School	None							
	59,000.00	Building	5 & 6 $\frac{1}{2}$	1916	1928-34			13,000.00
	102,500.00	Building	5 $\frac{1}{2}$	1916	1936			
Towns and Cities—								
Myton	10,000.00	Water	6 $\frac{1}{2}$	1915	1935			None
	8,000.00	Water	6 $\frac{1}{2}$	1916	1936			None
Duchesne	3,500.00	Water	6 $\frac{1}{2}$	1916	1936			None
	14,000.00	Water	6 $\frac{1}{2}$	1919	1939			None
	5,000.00	Water	6 $\frac{1}{2}$	1915	1935			None
	7,000.00	Water	6 $\frac{1}{2}$	1916	1936			None
Roosevelt City	25,000.00	Water	6 $\frac{1}{2}$	1918	1938			None
	12,500.00	Water	6 $\frac{1}{2}$	1916	1936			None
EMERY COUNTY:								
School District								
	12,800.00	Building	6 $\frac{1}{2}$	1910	1930			None
	15,000.00	Building	6 $\frac{1}{2}$	1911	1931			3,000.00
	2,500.00	Building	6 $\frac{1}{2}$	1909	1929			700.00
	2,500.00	Building	5 $\frac{1}{2}$	1906	1926			2,500.00
	5,000.00	Building	6 $\frac{1}{2}$	1907	1927			2,500.00
	65,000.00	Building	5 $\frac{1}{2}$	1916	1936			None
Cities and Towns—								
Emery	10,500.00	Water	6 $\frac{1}{2}$	1918	1938	1928		

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
GARFIELD COUNTY								
School District	None							None
	21,500.00 Building		6 %	1914	1934	1924		None
	19,500.00 Building		6 %	1916	1936	1926		None
	2,900.00 Refunding		6 %	1916	1936	1926		None
Cities and Towns—								
Tropic	3,700.00 Water		6 %	1915	1935	1925		None
GRAND COUNTY								
	10,000.00 Court House		5 %	1903	1923	1913	7,000.00	8,118.04
	8,500.00 Bridge		5 %	1912	1932	1922		
	10,500.00 Bridge		5 %	1914	1934	1924		
School District	17,000.00 Building		5 %	1917	1937	1927		3,400.00
Cities and Towns	None							
IRON COUNTY	None							
School District	3,500.00 Building		5 %	1915	1921			
	50,000.00 Building		5 %	1916	1936			
	2,000.00 Building		6 %	1914	1934			
	50,000.00 Building		6 %	1914	1934			
	45,000.00 Building		5 %	1918				
	130,000.00 Building		5 %	1919			43,000.00	11,101.72
Cities and Towns—								
Cedar City	9,200.00 Water		8 %	1904	1924	1929	2,500.00	
	60,000.00 Water		6 %	1919	1939			
Parowan	5,880.00 Electric Lights		6 %	1907	1927			3,554.03
	25,000.00 Water		6 %	1912	1932			9,668.10

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
JUAB COUNTY								
School District	None							
Tintic School	11,000.00	Buildings	5 %	1912	1932	1922		11,000.00
Cities and Towns—	50,000.00	Buildings	5 %	1912	1927			10,000.00
Nephi	4,000.00	Paving	5 %	1917	1937	1927		5,885.49
	3,000.00	Water	5 %	1917	1937			
	4,000.00	Water	5 %	1916	1937			
	11,000.00	Electric lights	5 %	1916	1930			
	3,000.00		5 %	1909	1929			
	8,000.00		5 %	1901	1931			
KANE COUNTY	35,000.00	Court House	5½ %	1919	1939	1929		None
School District	900.00	Building	5 %	1914	1934			
	9,000.00	Building	6 %	1914	1934			
	17,500.00	Building	5 %	1915	1935			5,950.00
Cities and Towns	None							
MILLARD COUNTY								
School District	None							
	100,000.00	Building	5 %	1916	1936	1926		17,374.78
	10,000.00	Building	5 %	1916	1936	1926		7,875.00
	1,700.00	Building	5 %	1900	1920			1,600.00
	11,500.00	Building	6 %	1913	1933			3,500.00
	8,900.00	Building	6 %	1914	1932	1925		2,400.00
	1,700.00	Building	6 %	1914	1934			450.00

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
MILLARD COUNTY—Continued								
Cities and Towns—								
Delta	34,923.00	Sidewalks	6 $\frac{c}{c}$	1923				4,023.00
Fillmore	11,500.00	Water works	5 $\frac{1}{2}$ $\frac{c}{c}$	1910	1930	1920		5,000.00
	12,000.00	Electric lights	5 $\frac{1}{2}$ $\frac{c}{c}$	1917	1937	1930		1,200.00
	7,000.00	Paving	6 $\frac{c}{c}$	1918	1923			1,200.00
MORGAN COUNTY								
	None							
School District	2,750.00	Building	5 $\frac{c}{c}$	1900	1920			
	7,000.00	Building	5 $\frac{c}{c}$	1900	1920			
	20,000.00	High School	5 $\frac{c}{c}$	1913	1933			
Cities and Towns	None							
PIUTE COUNTY								
	20,000.00	Road	6 $\frac{c}{c}$		1940			
	15,000.00	Court House	6 $\frac{c}{c}$		1940			
School District	None							
Cities and Towns—								
Junction	6,000.00	Water	6 $\frac{c}{c}$	1913	1933	1928		800.00
Marysvale	15,000.00	Water	6 $\frac{c}{c}$	1916	1936	1926		

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
SALT LAKE COUNTY								
	350,000.00	Refunding	4 1/2 %	1906	1926		210,000.00	35,000.00
	750,000.00	Road	5 %	1919	1939			
Salt Lake City School District								
	248,000.00	Building	4 %	1908	1928			
	700,000.00	Building	4 %	1910	1930			
	325,000.00	Building	4 1/2 %	1912	1932		584,000.00	
	355,000.00	Building	4 1/2 %	1913	1933			
	200,000.00	Building	4 1/2 %	1916	1936			
	2130,000.00	Building	5 %	1919	1939			
Murray School District								
	35,000.00	Building	5 %	1910	1930	1920		
	30,000.00	Building	5 %	1914	1934	1924		
Granite School District								
	3,000.00	Building	5 %	1904	1924	1914		
	13,000.00	Building	5 %	1904	1924	1909		
	10,000.00	Building	5 %	1905	1925	1910		
	52,000.00	Building	4 1/2 %	1906	1926	1911		
	10,000.00	Building	4 1/2 %	1907	1927	1912		
	100,000.00	Building	4 1/2 %	1909	1929	1915	99,000.00	
	10,000.00	Building	4 1/2 %	1912	1932			
	100,000.00	Building	4 1/2 %	1915	1935			
	250,000.00	Building	4 3/4 %	1919	1939	1929		63,944.00
Jordan School District								
	30,000.00	Building	4 1/2 %	1906	1926	1911		
	30,000.00	Building	4 1/2 %	1907	1927	1912	20,000.00	
	40,000.00	Building	4 1/2 %	1908	1928	1918		
	60,000.00	Building	5 %	1910	1930		39,000.00	
	100,000.00	Building	5 %	1913	1933			
	25,000.00	Building	5 %	1914	1934			

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
Salt Lake City								
	500,000.00	Refunding	4 $\frac{1}{2}$ %	1901	1921			
	200,000.00	Refunding	4 $\frac{1}{2}$ %	1901	1921			
	500,000.00	Refunding	4 $\frac{1}{2}$ %	1901	1924			
	775,000.00	Refunding	4 $\frac{1}{2}$ %	1914	1934			
	350,000.00	Refunding	5 %	1918	1928		\$315,000 (1-10th	retired annu-
	250,000.00	Permanent Imp'n'ts	5 %	1919	1939		\$12,000 retired annually	ally
	850,000.00	Improvement	4 $\frac{1}{2}$ %	1915	1925	After 1915		
	475,000.00	Water	4 $\frac{1}{2}$ %	1908	1928	After 1918		
	525,000.00	Water	4 $\frac{1}{2}$ %	1914	1934			
	554,000.00	Water	5 %	1919	1939			
	150,000.00	Imp. Sewer	4 $\frac{1}{2}$ %	1905	1925	After 1915		
	125,000.00	Imp. Sewer	4 $\frac{1}{2}$ %	1908	1928	After 1918		
	375,000.00	Imp. Sewer	4 $\frac{1}{2}$ %	1914	1934			
	196,000.00	Imp. Sewer	5 %	1919	1939			
Murray City								
	20,000.00	Water	5 %	1910	1930	1920		
	60,000.00	Light	5 %	1912	1932	1922		
	125,000.00	Water	5 %	1919	1939			
Midvale City								
	35,000.00	Water	5 $\frac{1}{2}$ %	1916	1936	1926		One mill levied 1919 for sinking fund)
RICH COUNTY								
	None							
School District								
	16,000.00	Building	6 %	1913	1933			
	4,200.00	Building	6 %	1912	1932			
	7,500.00	Building	5 $\frac{1}{2}$ %	1912	1932			4,000.00
Cities and Towns								
	None							

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
SAN JUAN COUNTY								
	14,500.00	Road	5 %	1914	1934	1924		
	10,000.00	School	6 %	1914	1934	1924		
	8,000.00	School	5 %	1916	1936	1926		
	36,000.00	Court House	5 1/4 %	1920	1940	1930		
School District								
	4,000.00	Building	5 %	1913				
	10,000.00	Building	6 %	1915	1935			1,025.00
	32,500.00	Building	5 %	1919	1939			
Cities and Towns	None							
SANPETE COUNTY	None							
South Sanpete School								
	25,500.00	Building	5 %	1908	1928			
	15,000.00	Building	6 %	1905	1925			
	18,000.00	Building	6 %	1910	1930	1920		6,359.44
	18,000.00	Building	5 %	1909	1929			
	2,500.00	Building	5 %					
	1,500.00	Building	5 %					
North Sanpete School								
	25,000.00	Building	5 %	1911	1921			
	9,200.00	Building	5 %	1912	1922			
	13,000.00	Building	5 %	1912	1932	1922		
	11,000.00	Building	5 %	1913	1923			
	30,000.00	Building	5 %	1915	1935	1926		2,000.00
	90,000.00	Building	5 %	1919	1939	1929		
	3,200.00	Building	6 %	1909	1929			3,200.00
Cities and Towns—								
Centerfield								
	7,000.00	Water	5 1/4 %	1916	1936	1931		
	8,000.00	Water	6 %	1913	1933	1933		

BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)

REPORT OF INDUSTRIAL COMMISSION

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	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
SANPETE COUNTY:								
Moroni	20,500.00	Water	6 %	1913	1933	1923		
Manti	25,000.00	Electric lights	5 %	1910	1930	1920	17,000.00	
	15,000.00	Water	5 %	1910	1930	1920	13,000.00	
	20,000.00	Electric lights	5 %	1919	1939	1929	10,000.00	10,000.00
Ephraim	12,000.00	Electric lights	6 %	1905	1925	1915		
	12,000.00	Water	5 %	1911	1931	1921		
	14,000.00	Water	5 %	1911	1931	1921		
	6,000.00	Floating Debt	5 %	1911	1931	1921	7,000.00	
	15,000.00	Water	5½ %	1916	1936	1926		
Spring City	15,000.00	Electric lights	6 %	1916	1936	1926		3,000.00
	5,000.00	Electric lights	6 %	1917	1937	1927		1,000.00
Fort Green	5,000.00	Water	6 %	1913	1933	1918		
	9,000.00	Water	5 %	1913	1933	1918		
Gunnison City	17,200.00	Water	5 %	1910	1930	1920		
Fairview City	15,000.00	Electric lights	5 %	1910	1930	1920		
	25,000.00	Water	6 %	1916	1936			
Mt. Pleasant	15,000.00	Water	5 %	1919				
	38,000.00	Electric lights	6 %	1919				
	25,000.00	Water	6 %	1919				

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
SEVIER COUNTY								
School District	None							
	2,700.00	Building	5 %	1903	1924	1909		
	20,000.00	Building	5 %	1906	1926	1911		
	5,500.00	Building	5 %	1906	1926	1911		
	6,000.00	Building	5 %	1905	1925	1910		
	10,000.00	Building	5 %	1905	1926	1911		
	4,500.00	Building	5 %	1911	1931	1916		
	50,000.00	Building	5 %	1913	1933			
Cities and Towns—								
Elsmere	4,080.00	Water	5 %	1909	1929	1919		1,087.10
	10,000.00	Water	5 1/2 %	1917	1937	1927		
Monroe	8,000.00	Light	5 1/2 %	1917				
	2,000.00	Water	8 %	1918				1,402.00
	10,000.00	Light	5 %	1912				
Koosharem	7,800.00	Water	6 %	1919	1939	1929		390.00
Anabella	2,000.00	Water	5 %	1912	1932	1922		
Redmond	4,000.00	Water						
Salina City	17,600.00	Water	6 %	1909			11,000.00	
Richfield	14,000.00	Water	5 %	1903	1923			
	25,000.00	Sewer	5 %	1915	1935			
	60,000.00	Paving	6 %	1914	1934			

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

REPORT OF INDUSTRIAL COMMISSION

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	Amount Issue	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
SUMMIT COUNTY								
North Summit	None							
School District	35,000.00	Building	5 %	1913	1923		31,000.00	
South Summit								
School District	30,000.00 2,000.00	Building	5 1/2 % 3 %	1914	1934			3,000.00
SUMMIT COUNTY:								
School District	20,000.00	Annex to H. School	6 %	1914	1924			9,272.40
Cities and Towns—								
Park City		Water Works	6 %	1910	\$12,500 every 5 years		37,500.00	18,073.44
UTAH COUNTY								
Provo School District	50,000.00	Building	4 1/2 %	1909	1929	1919		23,315.00
Nebo School District	150,000.00 14,000.00	Building	5 % 6 %	1911 1911	1935 1921			8,000.00
Alpine School District	33,000.00 30,000.00 35,000.00 20,000.00 60,000.00	Building	5 % 5 % 5 % 5 % 5 %	1911 1910 1912 1912 1912	1931 1925 1932 1932 1932	1922 1922		

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
UTAH COUNTY—Continued								
Provo City	100,000.00	Water	4 1/2 %	1902			25,000.00	
	35,000.00	Water	4 1/2 %	1905				
	90,000.00	Water	5 %	1910				
	75,000.00	Water	5 %	1919				
	75,000.00	Court House	5 %	1919				
Payson City	12,000.00	Light	5 %	1905	After 10 yrs. 8,000 in '23 10,000 in '28		5,000.00	2,494.96
	43,000.00	Water	5 1/2 %	1913	Bul. in '33 1927			6,913.35
Lehi City	20,500.00	Water	5 %	1907	1929	1917		7,500.00
	8,000.00	Water	5 %	1908	1931	1914		
	20,000.00	Water	5 %	1908	1939			
	13,000.00	Refund	5 %	1911	1931			7,500.00
	5,000.00	Cont.	5 %	1911				
Spanish Fork	16,750.00	Water	4 1/2 %	1903	1923			
	40,000.00	Water	6 %	1918	1938			
	9,500.00	Water	5 1/2 %	1920	1940			
	15,000.00	Paving	5 1/2 %	1920	1940			
Santaquin	10,500.00	Water	5 %	1911	1931	1921		9,000.00
Salem	6,000.00	Light	5 %	1912	1932			2,811.46
Pleasant Grove	9,900.00	Water	6 %	1906	1926			2,985.37
American Fork	20,000.00	Water	5 %					14,500.00
Springville	14,500.00	Water	6 %	1914	1934	1924		9,625.00

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
UINTA COUNTY								
	8,000.00	Jail	5 %	1911	1931	1921		17,121.00
	8,000.00	Bridge	5 %	1911	1931			
	110,000.00	Road	5 %	1919	1939			
	30,000.00	Road	5 %	1919	1939			
Uinta School District								
	1,400.00	Building	6 %	1917	1932	1917		
	3,800.00	Building	6 %	1917	1920	1910		
	6,000.00	Building	6 %	1917	1929	1914		
	4,500.00	Building	6 %	1917	1933	1918		8,373.34
	4,000.00	Building	6 %	1917	1932	1917		
	1,600.00	Building	6 %	1917	1938	1918		
	130,000.00	Building and Furn.	5 %	1917	1936	1926		
Vernal City							7,000.00	4,325.91
	12,000.00	Water	5 %	1909	1929	1922		
	10,000.00	Water	5 %	1912	1932	1927		
	35,000.00	Water	5 1/2 %	1917	1937			
TOOELE COUNTY								
School District								
	None							
	30,000.00	High School	5 %	1912				
	20,000.00	Building	5 %	1909				
	25,000.00	Building	5 %	1912				
	10,000.00	High School	6 %	1913				
	6,000.00	Building	6 %	1913				
Cities and Towns								
Tooele City	64,000.00	Water	6 %	1915	1930		50,000.00	564.70
Grantsville	3,500.00	City Hall	6 %	1917	1937			

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
WASATCH COUNTY								
School District	None							
	50,000.00 Building		5 %	1912	1932	1917		5,000.00
	15,000.00 Building		5 %	1912	1932			
	5,000.00 Building		5 %	1909	1924	1914		3,000.00
Cities and Towns—								
Midway	2,000.00 Electric lights		5 %	1917	1937			
	4,000.00 Electric lights		5 %	1916	1936			
	5,500.00 Electric lights		5 %	1915	1935			
Heber City	16,000.00 Water		5 %	1905	1925	1915	12,000.00	
	29,000.00 Lights		5 %	1909	1929	1919		
	7,000.00 Lights		6 %	1911	1931	1921		
Charleston	7,000.00 Electric lights		5 %	1909	1929			
WASHINGTON COUNTY								
School District	None							
	13,000.00 Building		5 %	1916	1936	1926		6,251.52
	17,000.00 Furn. and Equip.		5 %	1916	1936	1926		
	8,000.00 Furn. and Equip.		5 %	1919	1939	Serially		
	75,000.00 Furn. and Equip.		5 %	1919	1939			
Cities and Towns—								
Hurricane	20,000.00 Water Works		6 %	1916	1936	1926		
	14,000.00 Water Works		6 %	1920	1940	1930		

**BONDED INDEBTEDNESS OF COUNTIES, SCHOOL DISTRICTS AND INCORPORATED CITIES
AND TOWNS IN UTAH ON JANUARY 1, 1920—(Continued)**

	Amount Issued	Purpose	Rate	Date	Maximum Maturity	Optional Payment	Unpaid Balance	Reserve Set Up
WASHINGTON COUNTY:								
St. George	10,500.00	Water Works	5 $\frac{1}{2}$ %	1908	1928	1918		1,587.00
Enterprise	2,000.00	Water	6 $\frac{1}{2}$ %	1915	1935	1920		300.00
	3,000.00	Water		1916	1936	1921		
WAYNE COUNTY	None							
School District	None							
Cities and Towns	None							
WEBER COUNTY	80,000.00	Improvement	4 $\frac{1}{2}$ %	1902	1922	1912	10,000.00	
Ordan School District	100,000.00	Buildings	4 $\frac{1}{2}$ %	1902	1922	1912	95,000.00	
	75,000.00	Buildings	4 $\frac{1}{2}$ %	1908	1928	1913	60,000.00	
	20,000.00	Refundings	4 $\frac{1}{2}$ %	1912	1932	1922		
	200,000.00	Buildings	4 $\frac{1}{2}$ %	1917	1937	1927	190,000.00	
	200,000.00	Buildings	4 $\frac{1}{2}$ %	1919	1939	1929		
Webster School District	3,500.00	Buildings	5 $\frac{1}{2}$ %	1902	1922			
	3,000.00	Buildings	5 $\frac{1}{2}$ %	1905	1925			

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